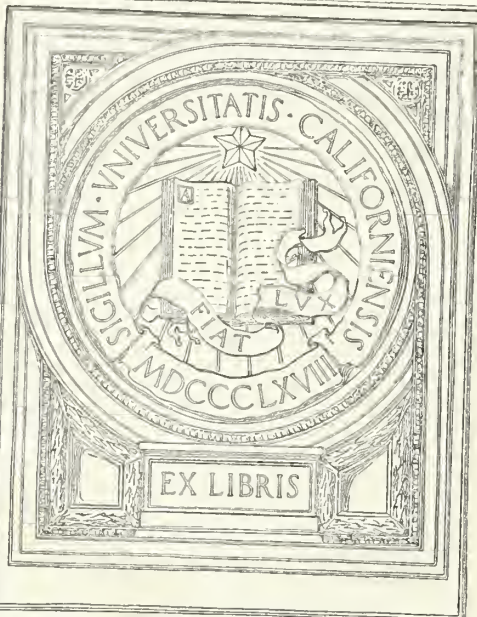




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### A CASE OF REFLEX SYMPATHETIC DYSTROPHY RELIEVED BY SYMPATHECTOMY\*

H. R. KAHLE, M. D.

NEW ORLEANS

This case is presented because it exhibits an interesting diagnostic problem and because it belongs, I believe, to a group of conditions which are little understood, and therefore, frequently mishandled.

#### CASE REPORT

W. J. M., a thirty-eight-year-old white male, a cable splicer by occupation, was admitted to the Veterans Hospital at New Orleans on December 18, 1947. His chief complaint was burning pain in the right shoulder, arm, and forearm. Symptoms had begun in March, 1944, when he had noted a sharp, stinging sensation in the right forearm while loading boxes on a truck. This had been associated with a soft swelling about the size of a lemon on the posterolateral aspect of the forearm in its upper third. Shortly afterwards, other tender nodules had appeared over posterior and lateral aspects of forearm, the lateral aspect of the arm, and the right scapular area. These nodules had subsided after a few days, leaving a small, firm, slightly tender subcutaneous lump. About one month after onset, he had begun to have pain over these areas. The pain was described as stinging and burning as if ants were crawling under the skin. It was continuous and aggravated by exercise. Eight weeks after onset, he had noted that the skin over the painful areas was very elastic, that the subcutaneous fat was lacking, and the involved area was very sensitive to touch. Symptoms had persisted after discharge from the Army in July, 1944, but during the past few months had become more severe, worse at night, and incapacitating. Since February, 1945, he had

noted no increase in the area involved. There was no loss of strength in the right upper extremity, but after exertion, it tired easily and the hand became swollen. The patient had no symptoms other than those related in the present illness.

On physical examination temperature, pulse, and respiration were normal and the blood pressure was found to be 150/100 in the right arm. The pressure in the left arm was approximately the same, 148/96.

The patient was a well developed, well nourished white male who did not appear acutely ill. He was well orientated and seemed to be sincere and emotionally stable. The parts involved were the right scapular region, lateral half of right arm, posterolateral aspect of right forearm, the lateral half of dorsum of the hand and the right index and ring fingers. Over these areas the skin was paper thin and very elastic. Subcutaneous fat was lacking and sensitivity to touch marked. Over the arm, forearm, and hand were numerous dilated, tortuous veins. In the scapular region were multiple depressed, pigmented points. Pinkish-brown discoloration and definite increased temperature were present over arm and forearm. Muscular power and reflexes were normal. The brachial and radial pulsations were equal and of normal volume on the two sides. No bruit or thrill could be found. Adson's test was negative.

Blood and urine examinations were normal. The Kahn was negative.

X-ray studies of the chest, cervical spine, shoulder girdle, and upper extremities revealed no abnormalities except two very small cystic areas noted in the head of the first metacarpal of the right hand.

On January 3, a biopsy was taken from the right forearm. It was reported as showing skin, subcutaneous tissues, and venous thrombosis. The vein showed intimal thickening and scarring of the media. Diagnosis was phlebosclerosis.

On January 5, the venous pressure was measured and found to be 220 mm. in the right arm compared to 160 mm. in the left. There was no essential difference in the venous pressure of the two hands.

\*Presented at meeting of the Orleans Parish Medical Society, May 10, 1948.

On January 8, a venogram was done and was reported to show normal patency of the superficial and deep veins. The axillary vein and its tributaries were nicely demonstrated. A zone of spasm was noted in the basilic vein at one point.

Blood drawn from each arm simultaneously showed, in one instance, a definite increased oxygenation on the right side as evidenced by its brighter red color. This test was repeated but the second time no difference could be detected grossly.

Using 1 per cent novocain, a right stellate block was done on January 15. The patient was completely relieved of his pain for the duration of the block.

Operation: On January 23, 1948, under pentothal, ether, and curare, the second and third thoracic sympathetic ganglia with the intervening sympathetic trunk and the rami connecting them with the second and third intercostal nerves were removed. The posterior approach recommended by Smithwick was used for this preganglionic sympathectomy. A transient Horner's syndrome was noted for a day or two postoperatively, and atelectasis of the right upper lobe occurred but re-expansion was prompt and uncomplicated. The patient was discharged February 7, 1948, with complete relief of pain. The hyperesthesia and tenderness of the extremity had disappeared.

#### DISCUSSION

In my opinion, this case belongs to a group of symptom complexes which have been given various names and which on superficial examination may seem to be unrelated. The term used or coined has usually served to emphasize the symptoms or signs which were outstanding in the case described but all tend to have in common, pain, sympathetic disturbances, and trophic changes.

Pain tends to be causalgia-like, that is, burning in character. There may be paresthesia and areas of hyperesthesia or there may be hypesthesia. The sensory finding often do not fit known or recognizable neurological patterns. The sympathetic imbalance may be manifested in protean ways, and in different cases there may be diametrically opposite effects. Thus in one there may be increased temperature locally, while in another it may be decreased. Trophic changes may be predominantly in the bones as in osteoporosis or Sudek's atrophy, or there may be an atrophy of the subcutaneous tissues as in the case reported.

It is frequently difficult to explain the

mode of origin of pain in these patients, as pain perception has both a psychic and a physiologic basis. Furthermore, opinions are in some instances controversial and answers to certain questions have yet to be supplied by the neurophysiologist. For instance, the question of whether or not the sympathetics carry afferent pain fibers is not yet decided. The consensus of opinion is that they do not, although Threadgill has recently presented evidence to the contrary. Time and space do not permit a consideration of the explanations which have been offered as to how a single stimulus or one of relatively short duration can result in indefinitely prolonged response. Livingston<sup>1</sup> in *Pain Mechanisms* has emphasized the importance of the internuncial pool, and that in thinking of response to sympathetic stimulation, we must get away from our classical conceptions of the spinal reflex or short neuron arc. Sympathetic response is diffuse, prolonged, and often delayed. Therefore, according to Livingston, it is possible to set up a self-perpetuating "vicious circle." Kolodny<sup>2</sup> has emphasized the far reaching effects of peripheral sympathetic stimulation by showing the changes in the pattern of the electroencephalograph which such stimulation provokes. He believes that many common clinical observations such as syncope on pleural puncture can be explained on reflex cerebral vasoconstriction resulting from a peripheral stimulus, and Volkmann's contracture on reflex arterial spasm. The field is open for fruitful speculation on problems of major clinical significance—peptic ulcer and hypertension for instance.

It should be emphasized that it is not being implied in the type of case under discussion that pathology exists in the sympathetic nervous system. Sympathetic fibers, possibly on the afferent, but certainly on the efferent side, are merely transmitting impulses in a pathological reflex arc. The relief of pain in thrombophlebitis by lumbar sympathetic block has been explained by Oschner and De Bakey as resulting from relief of vascular spasm.

If we accept the theory that pain in



these causalgia-like syndromes is mediated through a reflex arc, the most rational approach to treatment is an attempt to interrupt this arc at some point. The logical point of attack would seem to be at the site of injury. In some instances the resection of a neuroma in an amputation stump or a neurolysis in a case of causalgia does give relief, but often this relief is temporary or fails completely. If it is kept in mind that the reflex may be perpetuating itself in the central nervous system this is not surprising. Phantom limb pain, for instance may not be relieved by reamputation. Likewise peripheral nerve block, sympathetic block, or the injection of a trigger zone as advocated by Stiendler are well worth trying before resorting to sympathetic surgery. Injections should be repeated if temporary relief is obtained. It is difficult to explain how a single block or even repeated blocks could give relief except on the grounds that we are interrupting a vicious circle because the injection of novocaine, the effects of which last only an hour or so, could hardly be expected to change existing local pathology directly.

Admittedly these patients are sometimes hard to evaluate. Occasionally there is a constitutional inferiority. Frequently the initial trauma is minor. Often the neurological findings do not fit recognized patterns, and the question of compensation in cases of occupational trauma may arouse the suspicion of malingering. Unquestionably, however, some of these patients have, in the past, been branded as neurotics, malingerers, or addicts, when actually organic pathology existed, and pain could have been relieved.

#### CONCLUSIONS:

1. A case of reflex sympathetic dystrophy of an upper extremity, relieved by dorsal sympathectomy, is presented.
2. This case is considered to belong to a group, all of which have in common the presence of pain, evidence of sympathetic disturbance, and trophic changes.
3. The role of the sympathetic nervous system in these syndromes is touched upon.
4. Treatment should consist in correction of obvious local pathology, injections of

trigger zones, peripheral nerve injections, sympathetic block, and physiotherapy when it can be tolerated.

5. Sympathectomy is a useful method of treatment in those cases in which sympathetic block affords only temporary relief.

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## INJURIES OF PERIPHERAL VESSELS\*

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SHREVEPORT

Isolated injuries of major vessels of the extremities are not particularly common in civilian life, although, often enough, serious extremity injuries have a complicating factor of impaired circulation. Such isolated injuries, moreover, are not too common in military surgery. De Bakey and Simeone<sup>24</sup> in a most excellent and thorough statistical study of some 2,400 World War II cases state that an over-all incidence of 1.4 per cent is fairly representative.

#### CLASSIFICATION

Injuries of peripheral vessels may be divided into two broad groups: (1) the nonpenetrating and (2) the penetrating. In the nonpenetrating variety are included (a) concussion or contusion of major vessels and (b) cold injury. In the second group of penetrating injury may be included: (a) complete severance of a major

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vessel, (b) "false" aneurysm and (c) arteriovenous fistula.

#### BASIC PRINCIPLES

There are three basic principles which, if borne in mind, are of prognostic, prophylactic and therapeutic value. The first of these is that *trauma is more serious if a vascular lesion pre-exists*. The most practical import of recognizing this fact, perhaps, is in the prevention of cold injuries, i.e., in having those individuals so predisposed to avoid exposure. The second basic principle is that *gangrene develops when there is a discrepancy between tissue demands and blood supply* (Figure 1). Bearing this in mind will prevent one from making such therapeutic blunders as increasing tissue demands by the use of a heat cradle when the blood supply is impoverished. The third basic principle, and certainly the most clinically important, is that *vasospasm is an invariable accompaniment of vascular injury* 6, 32, 36, 46, 48, 57, 68.

#### NON-PENETRATING INJURIES

*Contusion*: It is difficult to estimate how many instances of gangrene have resulted

from simple contusion or concussion of a major vessel. We<sup>3</sup> have reported a case of thrombosis of the radial and ulnar arteries from pressure on the forearm during sleep and an instance where extensive gangrene of the hand developed from intense vasospasm following contusion of an extremity. Such instances are not too uncommon. As the result of injury to an extremity, an extensive and serious vasospasm may result and/or there may be actual thrombosis in a major vessel endangering part of the extremity. Such injuries, too, are frequent in extremity injuries primarily of the soft parts or of bone, and many account for the interference with circulation in such injuries. The most important clinical point is to recognize the associated vasospasm and early institute measures to relieve it.<sup>37</sup>

*Cold injury*: There are several types of injury included in this category: Chilblains (pernio), frost bite, trench foot, immersion foot and high altitude frost bite. Chilblains is quite similar to trench foot in its pathogenesis and pathology<sup>50</sup> but is likely to oc-

#### SKETCH ILLUSTRATING HOW GANGRENE MAY RESULT FROM DIMINISHED FLOW OR INCREASED TISSUE DEMANDS.

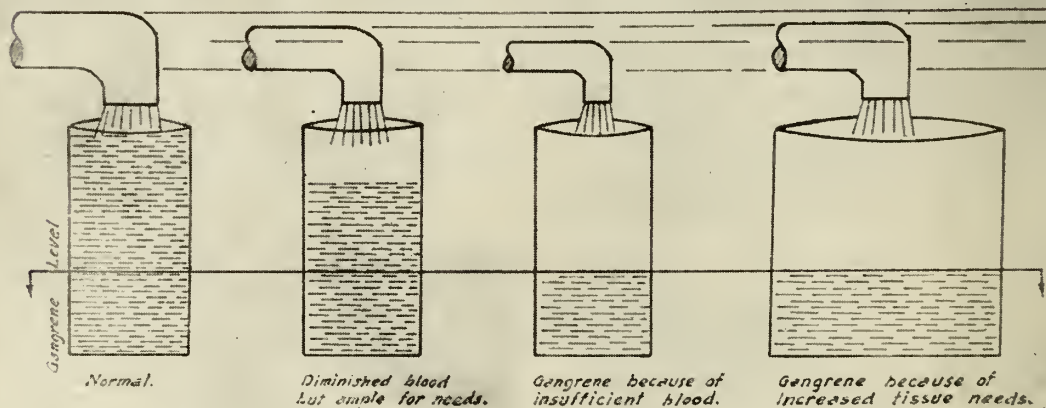


Fig. 1.



cur only in susceptible individuals, with even moderate exposure to cold. The skin appears to be chronically inflamed, is cold to the touch and is moderately painful.<sup>67</sup> "Frost bite", according to Lewis,<sup>50</sup> should be reserved for actual solidification (freezing) of tissues. Trench foot is the result of exposure of the feet to coldness and dampness. Immersion foot is the result of prolonged exposure of the extremities to cold water. High altitude frost bite is the condition which develops from the extreme cold, stasis and anoxia present in flying at high altitudes.

Cold injury is, undoubtedly, the most frequent type of vascular injury in both civilian and military practice. For example, in the 5th Army, for the week ending January 14, 1945, 46 per cent of all casualties were "trench feet"<sup>19</sup> and frost bite was a constant hazard of high altitude flying.<sup>23</sup>

It is not definitely proven that the pathology in all types of cold injury is identical, but there is definite indication that it is. Latimer<sup>45</sup> described the pathology of trench foot and divides it into three states: (1) the pre-hyperemic or ischemic state, (2) the hyperemic or inflammatory state and (3) the post hyperemic stage. Probably the best conception of the underlying pathologic physiology has been that of Loewe, Lange and associates<sup>40, 41, 42, 51</sup>. It has long been realized that both vasospasm and thrombosis were present, but the *time lag* in the development of thrombosis and its clinical significance has only recently been appreciated. Thus Loewe, *et al* have shown, by animal and human experiments on frost bite that the following four stages can be noted: (1) immediate slowing of the blood due to arteriolar (vasospastic) constriction; (2) anoxia, resulting in increased capillary permeability; (3) one-half hour after exposure this anoxia and permeability cause vasodilatation and swelling—the red cells are clumped because of hemoconcentration, but no clot is apparent until (4) after 72 hours. These same changes are presumed, but not proven, to occur in other types of cold injury. This conception has resulted in a new therapeutic approach (v.i.)

Undoubtedly, the prevention of these cold injuries is far better than trying to treat them once they have occurred. The best prophylactic measure would be the avoidance of exposure by susceptible individuals, that is, those with cold sensibility or peripheral vascular disease. Brahdý<sup>10, 11</sup>, in a study of frost bite among New York City employees, found that a temperature below 14° F. constituted an industrial hazard, particularly if the individual already had diabetes or arteriosclerosis. Patterson and Anderson<sup>62</sup>, as the result of study of exposure cases on Attu, recommended eliminating from exposure, as far as practical, those with previous foot or leg injury, those with signs suggesting vasomotor instability or peripheral vascular disease, and those with foot infections. In addition to eliminating, as much as possible, susceptible individuals from exposure, the use of protective clothing and devices, combating of stasis and dampness by exercise, massage and change of socks were used in an effort to reduce the number of cold injuries.

Once symptoms have been induced by exposure to cold, it is extremely important that the individual be removed from the low temperature. As Brahdý<sup>10, 11</sup> pointed out in his reports, an important prognostic point is the length of exposure after the first symptom: the sooner the exposure is eliminated, the less likelihood there is of dire consequences. In handling trench feet and similar cold injuries during World War II, the results were disappointing. Often it was patently impossible to remove the exposed individual promptly. Once he was hospitalized, the usual therapy was bed rest, preservation of heat by wrapping in sheet wadding, in some instances sympathetic procaine block, prevention and treatment of infection, relief of pain. Once demarcation had occurred, in those cases progressing to gangrene, amputation was necessary. Many cases never developed gangrene, but retained painful, discolored, disabling extremities<sup>45, 61</sup>.

The studies of Lange and his associates<sup>40, 41, 42</sup> may well alter our results in the

treatment of cold injury, particularly the frost bite seen in civilian practice. Based on their experimental and clinical observations (v.s.) they conclude that if heparin is administered within forty-eight hours of exposure, the occlusive red-cell masses do not form, and subsequent gangrene is thus prevented. They furthermore confirmed previous observations that both cooling and warming are harmful and that maintenance of normal room temperature is the safest procedure. In the exudative stage, sympathetic block may help by causing complete, rather than localized vasodilatation, thus increasing tissue circulation, relieving anoxia, increasing lymph circulation and reducing the edema. In those cases developing gangrene, one may be quite conservative, removing only the dead tissue.

#### PENETRATING INJURIES

*Severance of a main artery:* As previously noted, DeBakey and Simeone<sup>24</sup> in a study of 2,400 World War II cases found an overall incidence of major arterial injury to be 1.4 per cent. Odom<sup>59</sup>, who was surgeon to the 3rd Army, reported that of 92,000 casualties treated by 3rd Army installations only 837 or 0.9 per cent were classifiable as primarily vascular. This does not mean that injuries to major vessels were not more frequent, but that extensive soft tissue damage or badly compounded fractures made the arterial injury not the primary diagnosis.

In cases in which a main artery is severed, the purposes of treatment are twofold: (1) control of the hemorrhage, combating shock, prevention of infection and (2) preservation or increasing the blood supply. In carrying out these purposes there is the tourniquet, for temporarily controlling the bleeding; blood and blood fractions for shock; debridement, chemotherapy, antibiotics and immunotherapy to prevent infection. The role of refrigeration is debatable. Holman<sup>37</sup> suggested the use of ice bags in front line casualties, (an impracticable idea for several reasons) on the theoretical grounds that shock would be reduced, infection held in abeyance and the tourniquet could be left on safely for a

longer period. Likewise, Crossman and Allen<sup>21</sup> do not agree with Standard<sup>72</sup> that there is damage to tissue by prolonged exposure to refrigeration temperatures. However, as De Bakey and Simeone<sup>24</sup> point out, the "wisdom of actual refrigeration is still open to question for any purposes except to control infection and diminish lymphatic absorption from an infected limb prior to amputation, or to permit amputation without anesthesia in an aged and debilitated subject." Despite Crossman and Allen's enthusiasm, there is evidence<sup>12, 17, 43, 44</sup> demonstrating that refrigeration impairs wound healing, wound infection progresses more rapidly once refrigeration is stopped, and nerve damage is likely to occur.

Sympathetic interruption to relieve vasospasm is well entrenched in the treatment of vascular injuries. It has been amply shown that vasospasm is an invariable accompaniment of vascular injury and its relaxation by procaine sympathetic blocks was frequently used to help in the development of collateral circulation and the preservation of the part. Published figures<sup>24</sup> might indicate that poorer results were obtained from sympathectomy than from sympathetic block, but this is probably explained on the basis of the fact that sympathectomy was often only used as a last resort and in practically unsalvageable cases. Though it is difficult to prove, on the basis of published data, there is reason to believe that sympathetic block or sympathectomy may play an important part in the preservation of a vascularly endangered extremity.

In the management of severed major arteries, both venous and arterial ligation have been practiced. Holman and Edwards<sup>38</sup> showed experimentally that if the vein is ligated higher than the artery, both the blood pressure and the blood flow are increased in the distal stump of the ligated artery. The experimental observations of Brooks and his associates<sup>13, 14, 15</sup> have indicated its value, though Leriche<sup>47</sup> believes the value derived from vein ligation is the result of relaxation of vasospasm for which we have more direct means of relief. De



Bakey and Simeone<sup>24</sup> give an extensive review of the pros and cons of this procedure and conclude that "ligation of the concomitant vein furnishes no protection whatsoever against the development of gangrene after acute arterial occlusion and ligation in battle casualties." Whether it is of value in civilian injuries is equally unlikely.

Arterial ligation was the most practical and widespread procedure practiced during World War II. This was not only because of the frequent lack of time for a more lengthy procedure, but often it was the only type of repair possible. As has been emphasized<sup>24</sup>, one must clearly distinguish between ligation in acute arterial injuries and ligation in a complication, such as an aneurysm; in the latter instance there have developed collaterals not present in acute lesions.

Theoretically, arteriorrhaphy, either with some appliance such as the Blakemore tube or by simple suture repair, should be the best procedure. Yet, statistically at least, simple ligation in acute injuries does not appreciably affect the incidence of gangrene. It should be remembered that there are certain "critical arteries", or more specifically, gangrene is more likely to follow ligation of some arteries than of others. Thus ligation of the femoral artery will result in 80 per cent incidence of gangrene, as compared to 50 per cent following ligation of the axillary artery, 35 per cent following ligation of the brachial artery and 71 per cent following ligation of the popliteal<sup>70</sup>. This factor of varying importance of different arteries, plus varying degrees of associated injury, plus the fact that exactly comparable circumstances rarely exist in two series being treated, one by ligation, the other by repair, make it impossible to accurately interpret comparative figures. Admitting the inaccuracies, little confidence can be based on the figure of Smith<sup>70</sup> and of Rose, Hess and Welch<sup>66</sup>, showing 50 per cent gangrene in cases of ligation as compared to 44 per cent after some type of anastomosis, or of Odom<sup>59</sup> showing 50 per cent gangrene following ligation as compared to 53 per cent following an anastomo-

sis, or of De Bakey and Simeone<sup>24</sup>, with 48.9 per cent gangrene after ligation compared to 44.4 per cent following repair. Certainly in civilian practice the injuries are likely to be less severe, the cases are likely to receive definitive treatment earlier and under less harried circumstances, and it should be possible to do reparative procedures more and more frequently either by simple suture, by vein graft or by some type of tube repair. The addition of heparin<sup>58</sup> to the therapeutic armamentarium may prove helpful, but this remains to be seen. In ligation of a main artery two things should be borne in mind: First, the ligation should not be in continuity, but rather should the vessel be severed between ligatures<sup>27</sup>, thus helping to relieve vasospasm by doing, in effect, a periarterial sympathectomy. Second, relaxation of vasospasm by procaine block or sympathectomy should be a *sine qua non*.

*"False" aneurysm*: This is in reality, a pulsating hematoma and results when there is an incomplete severance of an artery and the development of a hematoma in the soft parts surrounding it. Its dangers are twofold: First, it may rupture to the outside, producing secondary hemorrhage, or second, it may, in enlarging, further damage the peripheral arterial supply or damage nerves<sup>35</sup>. These should be recognized and treated early, by evacuation of the clot, ligating or repairing the vessel, as circumstances permit, and interrupting the sympathetic flow. If delay has occurred before the "false" aneurysm is recognized, and it is not enlarging and there is no danger of external rupture, then delay, to encourage the development of collaterals is justified.

*Arteriovenous Fistula*: Such a lesion obviously occurs when an artery and its concomitant vein are perforated. It is often not immediately diagnosed and there is little danger from secondary hemorrhage or soft tissue pressure, as the artery "decompresses" itself into the vein. We<sup>1</sup> have pointed out that the clinical effects of peripheral arteriovenous fistula can be divided into (1) the *local effects* (pulsating

tumor, bruit, and thrill), (2) the *peripheral effects* (admixture of arterial and venous blood, dilation of peripheral veins, etc.) and (3) the *systemic effects* (increase in pulse rate, increase in systolic pressure, decrease in diastolic pressure, increase in blood volume, late cardiac damage). Similarly, we have emphasized that the diagnosis is not difficult if it is suspected. The diagnostic points to be recalled are: (1) The history of a typical penetrating trauma; (2) the presence of a pulsating tumor with characteristic thrill and bruit; (3) dilated veins distal to the fistula with an increase in venous and oxygen tensions; (4) trophic disturbances distal to the fistula—edema, pigmentation, ulceration; (5) the Nicoladoni-Israel-Branham phenomenon. An arteriogram is frequently confirmatory.

The treatment of arteriovenous fistula should be either some type of aneurysmorrhaphy or quadruple ligation. In most instances, the quadruple ligation has been used and is quite satisfactory<sup>63, 65</sup>. In either type of treatment, preliminary development of collaterals, by fistula compression and sympathectomy are valuable adjuncts. Undoubtedly, the various types of anastomatic repairs, with or without heparin, will be increasingly useful.

#### SUMMARY AND CONCLUSIONS

1. Injuries of peripheral vessels may be divided into (a) non-penetrating and (b) penetrating varieties.

2. Non-penetrating injuries include (a) concussion and contusion and (b) cold injuries.

3. Penetrating injuries include (a) severance of an artery, (b) "false" aneurysm and (c) arteriovenous fistula.

4. Three basic principles in the management of peripheral vascular injuries are: (a) trauma is more serious if a vascular lesion pre-exists; (b) gangrene develops whenever there is a discrepancy between tissue demands and blood supply and (c) vasospasm is an invariable accompaniment of vascular injury.

5. Cold injuries are the most frequent type of peripheral vascular injury and its

several varieties are chilblains (pernio), frost bite, trench foot, immersion foot and high altitude frost bite.

6. In penetrating wounds in which a main artery is severed, the purpose of treatment is twofold: (a) control hemorrhage, combat shock, prevent infection and (b) preserving or increasing the blood supply. In most instances, ligation has been used but arteriorrhaphy will become increasingly more useful.

7. "False" aneurysm has two dangers: (a) it may rupture to the outside resulting in a secondary hemorrhage, or (b) by enlarging it may compress collaterals or nerve filaments. Therefore its early correction is usually indicated.

8. An arteriovenous fistula has local, peripheral and systemic effects which make its detection fairly simple. Such fistulae should be corrected, as soon as collaterals have been developed, either by arteriorrhaphy or quadruple ligation.

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# DISCUSSION

Dr. Isidore Cohn (New Orleans): Dr. Abramson's paper gives evidence of careful survey of the literature and excellent judgment. Under the heading of basic principles he mentions prophylaxis. Very properly he said trauma is more serious if a vascular lesion preexists. In a preventive way much can be done by proper attention to the lower extremities in the aged under ordinary conditions. I mean by that long before they have had an accident. In discussing injuries to the main arteries, Dr. Abramson mentions control of hemorrhage and shock, the prevention of infection and preserving or increasing blood supply. He expressed the hope that arteriorrhaphy will be used more frequently in the future. This presupposes that the facilities for suture and anti-

coagulants will become more generally available in our hospitals. It certainly is a development to be hoped for. With ever widening interest in vascular surgery, the principles for safer suture methods as well as so-called nonsuture methods are being offered for preserving the vascular channels after injury. He approached the early adequate management of damage to particular arteries—it is necessary that the surgeon know anatomy. If there are any former students of the late Dr. John B. Elliot they will remember his saying, "Gentlemen, remember anatomy." Direct anatomical approach saves time and structures. Too much has been covered to attempt a detailed discussion. Fundamental principles have been given by Dr. Abramson in concise manner. I would like to congratulate him on his splendid presentation.

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### THE CORRELATION BETWEEN CLINICAL ESTIMATION AND LABORATORY DETERMINATION OF FUNCTIONAL PULMONARY CAPACITY\*

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AND

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NEW ORLEANS

There have been many recent advances in the field of thoracic surgery. These advances have been due principally to perfection of newer and more versatile surgical technics, the development of satisfactory methods of anesthesia, the advent of the antibiotics which allow more successful combatting of infections, and the establishment of sound physiologic methods of pre- and postoperative care. As a result of these advances there has been a wide extension of general indications for major thoracic surgical procedures.

Any procedure which irreversibly decreases the functional capacity of one or both lungs should be undertaken only when the responsible physician believes that sufficient pulmonary function will remain to support the patient comfortably when he

engages in the minimum amount of activity necessary to life in bed. This simple principle has become more apparent and important as the horizons of thoracic surgery have been extended. If the total functional capacity be known, together with the distribution of this function between the two lungs, the surgeon can approach intelligently and with confidence the decision of operability for each patient. When this decision must be made on the basis of clinical judgment alone, some patients, even though they survive the surgical procedure, are left with pulmonary function so impaired that the result is complete invalidism, or at times an actual shortening of life to a degree not to be expected from the natural history of the pulmonary disease. Consequently, the study of pulmonary physiology in man has been accelerated and technics have been developed which permit a fairly precise determination of lung function.

Complete evaluation of pulmonary function, omitting the consideration of interrelated cardiac function, consists essentially of a consideration of two phases. First, the *ventilatory function*, or the ability of the anatomic apparatus to serve as a bellows in mechanically moving air in and out of the lungs. This depends on the action of the intercostal musculature and the diaphragm, the size, shape, and fixation or lack thereof of the costal cage, the presence or absence of pleuritis, and bronchial obstruction, as well as on the results of any actual involvement of lung tissue by a pathological process. Second, the true *respiratory function*, or the diffusion of gases across the alveolar membrane which depends on the conditions present at the alveolar epithelium and small pulmonary vessels on the one hand and on the conditions present within the oxygen-carbon dioxide transport system (red blood cells and plasma) and tissue acceptor system on the other hand. The strictly pulmonary side of respiratory function is diminished by pulmonary fibrosis, edema, accumulation or organization of exudates, and changes in the walls of the pulmonary blood vessels.

In intrathoracic disease there is almost

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always some impairment of both of these functions, and they are closely interrelated but not directly proportional one to the other. It is obviously necessary for ventilation to be adequate in order to obtain the required gaseous diffusion, but adequate ventilation does not necessarily imply sufficient respiration. Diffusion of gases must be adequate for ventilation to be effective, no matter how efficient ventilation per se may be; and at times impairment of ventilation of even marked degree may be compensated by the efficiency of gaseous diffusion in the localized areas which are unaffected by disease processes. These two functions, although sequential and superficially inseparable, often are not impaired in any direct proportion, and evaluation of one without adequate knowledge of the other can lead to grossly erroneous assumptions.

The logical approach to the evaluation of pulmonary function, therefore, depends on the proper correlation of these two phases of "respiratory" physiology. Ventilatory function may be measured by the determination of pulmonary volumina, the vital capacity and its various components, and by the determination of the maximum breathing capacity over a given, arbitrary, period of time, either after graded exercise or during forced voluntary hyperventilation. Respiratory function may be evaluated by analysis of gaseous exchange, either by direct analysis of alveolar air and blood gas tensions. Evaluation of total pulmonary function from measurements of ventilatory function alone often fails to give a true picture of the existing situation.

In the majority of patients with thoracic disease estimation of the total ventilatory and respiratory function, together with study of the history, physical examination, and roentgenograms, allow prediction of the effects of the contemplated surgical procedure upon these functions. However, these studies alone may be misleading and will result in false assumptions in approximately 15 per cent of patients evaluated by these methods only. Previous lung disease may have left residual damage which is un-

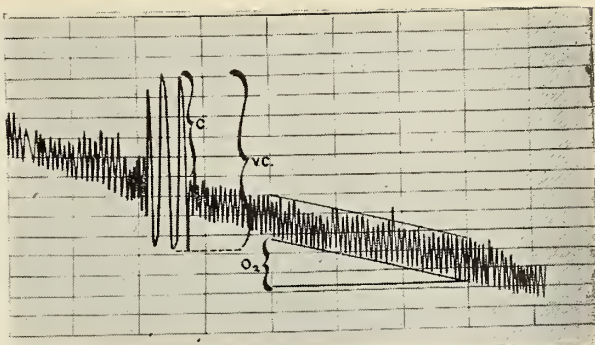


Fig. 1. Sample graphic record of total pulmonary function obtained with modified Benedict-Roth spirometer. By proper calibration the pulmonary volumina, minute volume of respiration, and respiratory rate can be determined.  $O_2$  consumption can be estimated from the slope of the curve.

detectable by x-ray, or the effects of the present disease are over-evaluated. By clinical judgment alone, one is unable to determine the distribution of the various functions between the two lungs of these patients. In such cases it would seem necessary to employ a technic of objectively quantitating this distribution. Bronchospirrometry, a procedure at least no more dangerous to or uncomfortable for the patient than simple bronchoscopy, offers such a method.

In doing bronchospirrometry routinely in the Lung Station of the Charity Hospital, we find that the data so obtained are usually merely a corroboration of the status of function predicted by our clinical evaluation, especially when supplemented by careful fluoroscopy. However, there are surprises which throw new light on surgical risk. It is not possible to know just where or in what patient we will meet with unexpected results. As previously stated, this group comprises about 15 per cent of all patients studied.

Most of our work with the double-barrel bronchial catheter has been on patients with tuberculosis, but the method is equally applicable and pertinent to all other surgical diseases of the chest. It should be stated that the results obtained by this method do not represent absolute determinations of pulmonary function due to the factor of stenotic resistance imposed by the catheter;

they are nevertheless reliable indices of the relative function between the two lungs, the factor of resistance being equal bilaterally. This equality of resistance permits one to

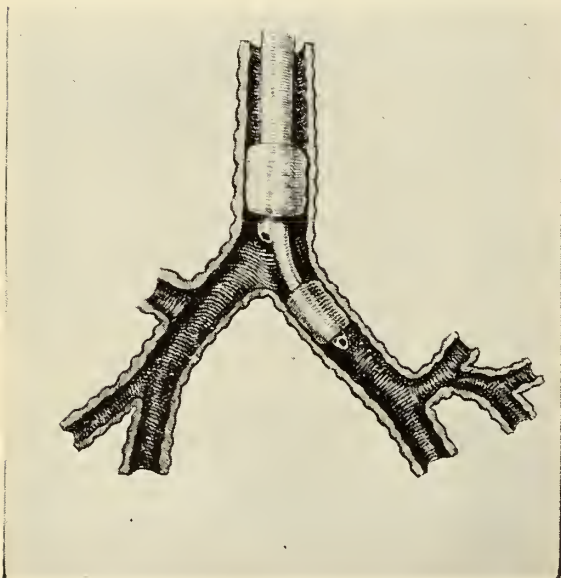


Fig. 2. Zavod catheter in proper position in trachea and left main stem bronchus for broncho-spirometric determinations. By connecting ends of catheter to separate recording spirometers simultaneous tracings may be obtained from right and left lobes. Tidal ventilation and  $O_2$  consumption may be measured as in Fig. 1.

express the values for each lung as a percentage distribution of the total pulmonary function.

The following illustrations and brief case summaries are examples of the discrepancy which may exist between clinical estimation and laboratory determination of pulmonary function.

Figure 3 is the roentgenogram of a patient with tuberculosis who gave a history of pleuritic pain in the right chest for four months. After the diagnosis was established, right pneumothorax was instituted but abandoned in six months due to numerous adhesions. One year later the studies illustrated in Figure 4 were done. Note the large cavity in the right upper lobe, the small area of pneumonitis in the left mid-lung zone, the absence of any definite evidence of pleuritis on either side, and the lack of any mediastinal shift. Total studies



Fig. 3.

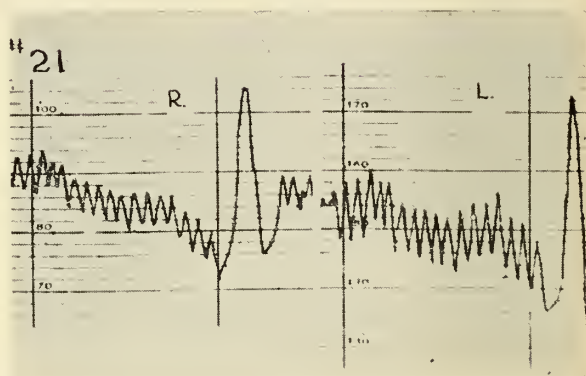


Fig. 4.

revealed moderate impairment of vital capacity (3.05 liters). It might be surmised from the history and x-ray that such reduction is largely due to the right-sided disease. Yet Figure 4 reveals that the ventilatory ratio is  $\frac{\text{Right}}{\text{Left}} = \frac{60.6}{39.4}$ . To explain this apparent discrepancy it should be remembered that, costal and diaphragmatic movement being sufficient, cavities which freely communicate with bronchioles may be ventilated freely. The previous pleuritis would appear to be less detrimental to ventilation than would be suspected. Also, since these



results are relative, it must be concluded that impairment of total function is due to increased ventilation on the left side to a great extent. This is probably due to previous disease, a history of which was not obtainable.

The respiratory ratio is  $\frac{\text{Right}}{\text{Left}} = \frac{37.1}{62.9}$ . Oxygen consumption on the right is markedly decreased in relation to ventilatory ability. This can be explained by impaired gaseous diffusion around the cavity, and the increased dead space produced by the cavity.

Figure 5 reveals a right-sided hydrothorax following therapeutic pneumothorax. Vital capacity was moderately reduced (2.74 liters). Figure 6 shows tracings

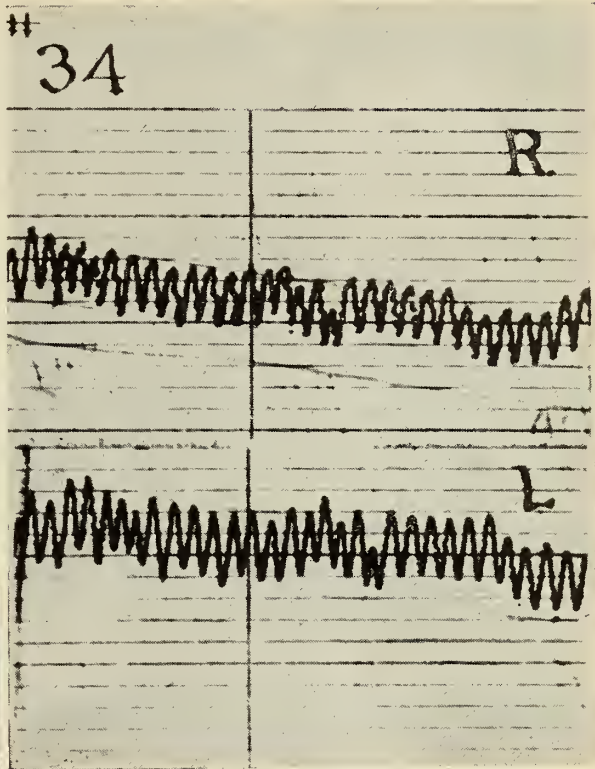


Fig. 6.

tion of the "good" left side is surprisingly poor.

Figure 7 presents a picture of residual

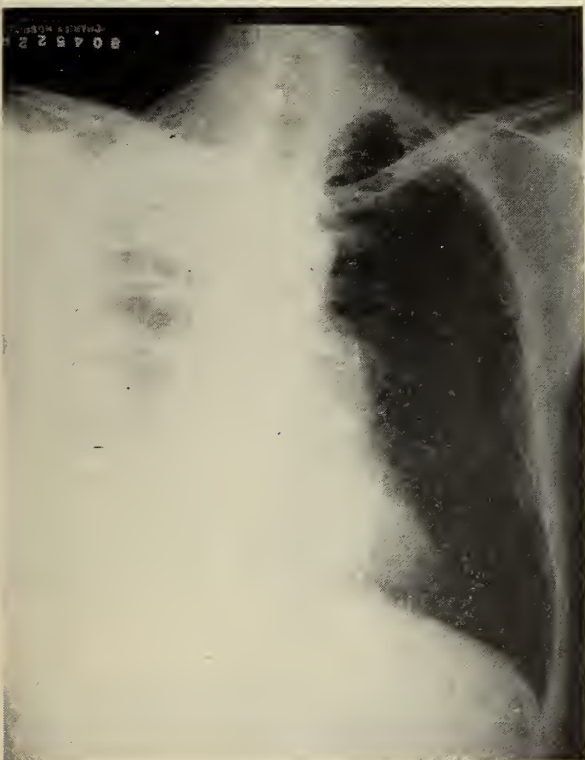


Fig. 5.

from this patient. The ventilatory ratio

was  $\frac{\text{Right}}{\text{Left}} = \frac{41.4}{58.6}$ . The respiratory ratio was

$\frac{\text{Right}}{\text{Left}} = \frac{53.3}{46.7}$ . The function on the obviously

diseased right side is surprisingly good. Of as great importance is the fact that, since total function shows impairment, the func-

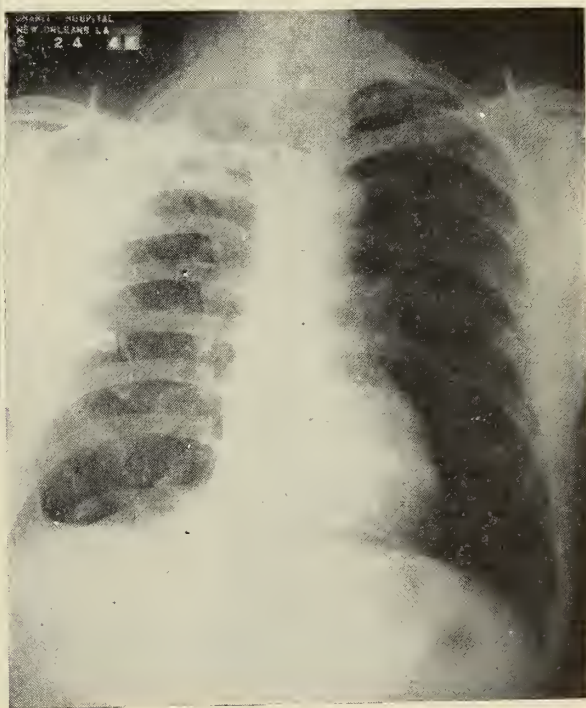


Fig. 7.

pathology following right pneumothorax complicated by effusion and converted to right oleothorax for one year. In this patient there also had been an unsuccessful attempt to establish pneumothorax on the left, suggesting pleural symphysis on that side.

Figure 8 illustrates bronchspirometric

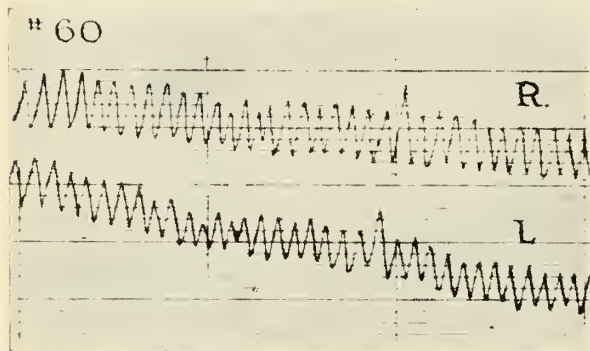


Fig. 8.

tracings on this patient. The vital capacity here was 2.74 liters. The ventilatory ratio

was  $\frac{\text{Right}}{\text{Left}} = \frac{56.4}{43.6}$ . The respiratory ratio was

$\frac{\text{Right}}{\text{Left}} = \frac{33.3}{66.7}$ . The normal ventilatory ratio

was unexpected as was also the discrepancy

between ventilatory and true respiratory function on the right side. Ordinarily, the pleural effects of oleothorax are considered to reduce the ventilatory much more than the respiratory function. However, the inapparent pleural symphysis on the left so impaired the ventilatory function on this side that the percentage distribution of ventilatory function between the two sides remained normal.

Figures 9 and 10 are x-rays of a patient

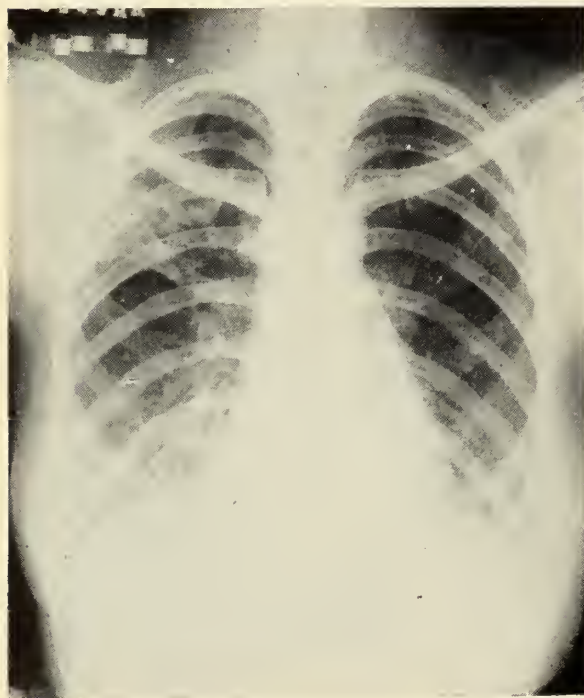


Fig. 9.

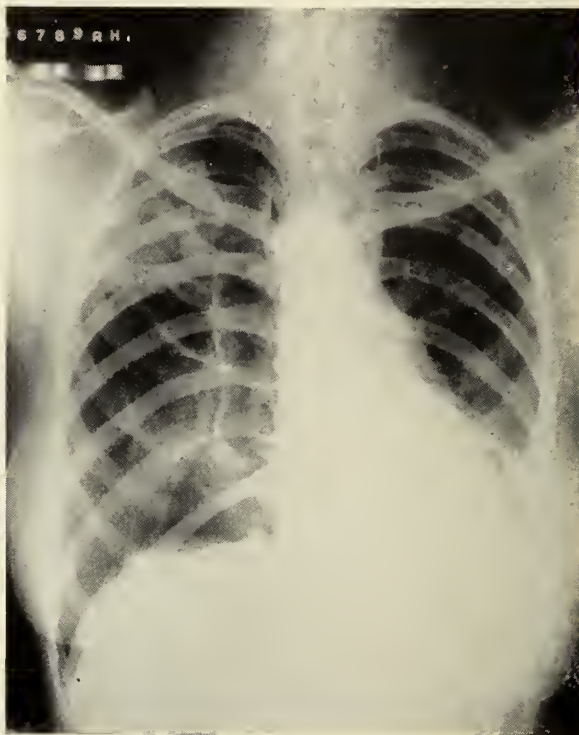


Fig. 10.

who had a pneumothorax started and abandoned on the right side before admission. Lung studies revealed the total pulmonary function to be too poor to consider collapse procedures as extensive as thoracoplasty so right pneumothorax was again established (Figure 10). Note the adherent areas with partial collapse of lung on the right and the mediastinal shift with compression of lung on the left. Bronchspirometry (Figure 11) revealed that the ventilation and oxygen consumption were significantly better on the right than on the left.



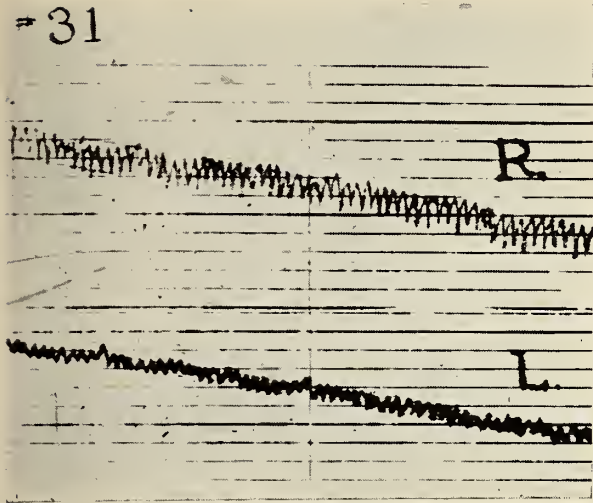


Fig. 11.

Ventilatory ratio:	Right	68.8
	Left	31.2
Respiratory ratio:	Right	52.4
	Left	47.6

Reduction of function on the left side was probably due to mediastinal shift with tracheobronchial compression, atelectasis, and retention of secretions.

There are similar records of many other cases in which fairly large errors of judgment would have been made had we been dependent upon clinical evaluation and x-ray diagnosis without the added knowledge revealed by bronchspirometry.

In conclusion, it should be emphasized that:

Candidates for thoracic surgery should be evaluated in the light of both ventilatory and respiratory function. Estimation of vital capacity alone is not sufficient and may be grossly misleading.

In about 15 per cent of such patients clinical judgment and total studies are insufficient to estimate the distribution of these functions between respective sides. At present this significant percentage of error can be avoided only by routine bronchspirometry. Consequently, the thoracic surgeon can receive great help from bronchspirometry both in the selection of suitable patients and in choosing the pro-

cedure most likely to effect a cure without producing serious respiratory embarrassment.

The authors acknowledge with thanks permission of the American Review of Tuberculosis to use in this paper illustrations which had appeared in the *Am. Rev. Tuberc.* 57:254, March 1948.

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## CLINICAL EXPERIENCES WITH THE Rh FACTOR IN OBSTETRICS\*

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NEW ORLEANS

The Rh factor was discovered by Landsteiner and Wiener<sup>1</sup> in 1940, while searching for an explanation of transfusion reactions in patients receiving blood which was compatible by all known tests. It was soon found that this factor is concerned in the causation of erythroblastosis fetalis, which has been recognized as a clinical entity for years. Subsequent studies showed that fetal hydrops and icterus neonatorum were also due to Rh incompatibility, and that these three conditions are simply variations of the same disease.

Many thousands of tests have shown that approximately 85 per cent of whites have the Rh factor, and are designated Rh positive. Negroes, Chinese, and American Indians show a much higher percentage (Table 1 from Levine). Those individuals not having the Rh factor are designated Rh negative.

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\*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

TABLE 1  
TESTS WITH ANTI Rh<sub>0</sub> SERUM

Race	Number Tested	+ %	— %	Incidence of Erythro- blastosis
				Fetalis %
Chinese	150	99.3	0.7	Very rare
White	234	85.0	15.0	2.1
Negro (Levine)	264	95.5	4.5	....
Negro (Landsteiner & Wiener)	113	92.0	8.0	0.7
American Indian	120	99.2	0.8	7

The Rh factor is not a single entity, but a complex one. Thus, another testing serum gives 70 per cent positive reactions (Rh<sup>1</sup>), and still another 30 per cent (Rh<sub>0</sub>). Some patients react to all three sera. The 85 per cent serum is the one generally employed. Elaborate studies have demonstrated the existence of other rare subgroups. It has also been found that sensitization has been caused occasionally by blood group incompatibility. For practical purposes, we are concerned chiefly with patients tested with the 85 per cent serum.

With 15 per cent of all females being Rh negative, we would expect to find a smaller percentage in married women. Thus Halperin, Jacobi, and Dubin<sup>2</sup> found 66 Rh negative women in 500 pregnant patients (13.2 per cent). Levin, Katzin, and Burnham<sup>3</sup> estimated that in 9 to 10 per cent of white marriages there will be the union of an Rh negative woman and an Rh positive man. In our series of 569 tests, there were 98 Rh negative women, a percentage of 17.3. Of the 74 husbands of these Rh negative women who were checked, 62 were positive and 12 were negative. The 24 not tested were nearly all husbands of primigravida.

However, the development of erythroblastosis in the baby occurs in only a small percentage of these marriages of Rh negative women to Rh positive men, and the reason is clear when the mechanism of the development of the condition is considered. If the fetus is Rh positive, some of its blood may in some way pass the placental barrier and get into the maternal circulation. This would produce sensitization of the mother to the Rh factor which she does not possess.

Levin<sup>4</sup> believes that only .13 cc. of Rh positive fetal blood is needed to produce this isoimmunization in the mother. Once this occurs, anti-Rh agglutinins are formed in the maternal blood stream. This development is gradual; the transfer of fetal blood probably occurs rather late in the first pregnancy, so that only isoimmunization is produced, and no antibodies are formed. In the next pregnancy, if the fetus is Rh positive, antibodies may be produced by the mother, and may pass back transplacentally to the fetus, producing destruction of the Rh positive red cells (carrying the Rh factor), with a resulting overstimulation of the blood forming organs, and an outpouring of immature red cells. This may not occur until the third or fourth pregnancy, or it may never happen in some marriages.

This sensitization may be produced, and has been produced in several patients coming under our observation, by transfusion of an Rh negative woman years before marriage with Rh positive blood. Levin and Waller<sup>1</sup> believe that intramuscular injection of blood in newborn female infants may have produced isoimmunization in some patients with no history of transfusion. In such patients, the first baby (and all subsequent ones), may be erythroblastotic. As mentioned previously, some cases of sensitization may be due to Rh subtypes, blood group incompatibility, or to the rare Hr factor. These are so infrequent that they do not give us much concern.

Once the state of isoimmunization is produced, it persists for the life time of the woman (Levin).<sup>5</sup> No method of desensitization has yet been devised. Ethylene disulfonate was used in 3 cases with apparently satisfactory results,<sup>6</sup> but was found to be of no avail in a patient treated by us. The fetus is not affected until late in pregnancy, as the antibodies usually develop after the fifth month, and the titer tends to rise as pregnancy advances. Hence, the Rh factor is not concerned in the causation of abortion.

It is therefore important to test all obstetrical patients for the Rh factor. If



there is no history of transfusion, the testing may be omitted in primigravida, but it should be done if transfusion becomes necessary. All multigravida should be tested, if possible. When the patient is found to be Rh negative, her husband and the child or children already born are tested also. If the husband is negative, there is no possibility of sensitization, as his children will all be negative. If the husband is positive, the wife should be tested for antibodies each month after the fifth month. If none are found up to the end of pregnancy, the prognosis for the child is good. However, in one such patient, the infant was rather severely affected, and antibodies were found in the maternal and fetal blood only after delivery. If antibodies are found, and the titer increases, the prognosis is guarded, and is worse in case blocking antibodies alone are present. About 50 per cent of these Rh positive husbands are heterozygous, in which instance there is a 50 per cent chance that the infant will be Rh negative, and hence will not be affected unless sensitization to one of the rare factors occurs. Tests of the children already born will help in settling this point.

If antibodies are found, and the titer is rising, it would appear best to remove the child from the unfavorable environment before term, either by induction of labor or by Cesarean section. However, these procedures have not proved of much value, at least in our hands. The hazards of prematurity are added to the damage already done by the sensitization. Still, such premature delivery is worth while if the antibody titer is very high. After delivery, it is advisable to transfuse the baby at once if its condition is not good, especially if the amniotic fluid has a yellowish tinge. Replacement transfusion is of value in severely ill babies of the icteric or anemic type. No treatment is of any value for babies of the hydropic type. If there is little or no clinical evidence of erythroblastosis, a blood count should be done at once, and transfusion of 30-40 cc. performed if indicated. These transfusions should be repeated as often as the blood count requires. In one

instance the baby was transfused 13 times over a period of six weeks. Only compatible Rh negative blood is used.

As stated above, of our 98 Rh negative patients, 12 are married to Rh negative men, and hence no sensitization is possible. Twenty-four husbands were not tested, their wives being primigravida with no history of transfusion. Hence, we have under consideration 62 Rh negative women with Rh positive husbands. Of these, in 43 instances Rh complications were possible. In 10 patients, the Rh factor did cause serious trouble, and 6 of these women lost a total of 8 babies (two women lost 2 each). These and other details are shown in table 2. The details of these 10 cases and of 6 others of interest are listed below in the case reports.

TABLE 2

TOTAL NUMBER OF WOMEN EXAMINED—569	
Rh positive women	471 82.7%
Rh negative women	98 17.3%
Husbands of Rh negative women:	
Rh negative	12
Not tested	24
Rh positive	62
Of the 62 Rh negative women married to Rh positive men:	
I. Set-up present for potential trouble	
	43 69.4%
a. Trouble occurred	10
b. No trouble	24
c. Not delivered yet	8
d. Result of pregnancy not known	1
II. Set-up not present for potential trouble	
	19
a. Delivered without trouble	16
b. Not delivered yet	3

## CASE REPORTS

## Case No. 1. Mrs. V. C.

1st Pregnancy—Cesarean Section eight months, placenta previa. Baby lived forty-four hours. Mother had one transfusion. Rh of donor and husband (first) not known.

2nd Pregnancy—second husband, cesarean section December 14, 1947. Wife Rh negative, husband Rh positive. Blocking antibody 1:16. Two doses ethylene disulfonate. Baby 5 lb. 14 oz., replacement transfusion. Lived.

The value of ethylene disulfonate in this case is questionable.

## Case No. 2. Mrs. C.

1st Pregnancy—Delivered May 4, 1934—Girl Rh positive.

2nd Pregnancy—Delivered March 19, 1943—Spontaneous abortion.

3rd Pregnancy—Delivered October 3, 1944—Girl Rh positive—Normal.

4th Pregnancy—Delivered February 20, 1947—Girl Rh positive. Transfused. Mother had albumen antibodies and slight trace of blocking antibodies.

Rh factor not implicated in abortion. In this person, the difficulty did not show up until the third full term pregnancy.

Case No. 3. Mrs. R. C.

Wife Rh negative, husband Rh positive; homozygous.

1st Pregnancy—August 11, 1943—Girl.

2nd Pregnancy—Delivered November 2, 1947, premature, 3 lb. 13 oz. Mother had strong Rh agglutinins and moderate blocking antibodies. Baby in hospital two months, 13 transfusions. Baby's blood Rh negative at all tests, probably is really Rh positive, but negative reactions due to transfused blood.

February 23, 1948—Mother's blood showed Rh agglutinins 1:16, blocking antibody 1:32. Prognosis poor for another pregnancy.

Case No. 4. Mrs. A. D. Rh negative.

1st Pregnancy 1935—Girl 9 lb. 14 oz., Rh positive; by first husband.

2nd Pregnancy 1937—Boy 8½ lb. Rh positive; by first husband.

3rd Pregnancy 1941—Boy 8 lb. 14 oz., Rh negative; by second husband.

4th Pregnancy 1945—Girl 7 lb., Rh positive; by second husband, lived five days; autopsy showed erythroblastosis.

5th Pregnancy 1946—Girl, term, Rh negative, section because of increasing titer of antibodies; residue from 4th pregnancy (?).

Second husband is hence heterozygous.

This represents a puzzler to us. The rising titer of antibodies suggested severe involvement and a bad prognosis, but the baby is Rh negative and unaffected, required no treatment.

Case No. 5. Mrs. DeB.

Transfused 1940, operation for ruptured appendix. Donor evidently Rh positive, not tested.

1st Pregnancy—1943, baby stillborn and macerated. Husband reported Rh positive, wife also reported Rh positive, later found to be an error, after second pregnancy had occurred, really Rh negative.

2nd Pregnancy—L.M.P. April 21, 1945. Antibodies found in July, increasing with subsequent tests. Section December 29, 1945, baby lived three days, transfused several times. Tests September 26, 1947 and February 19, 1948 showed antibodies persisting. Mother evidently sensitized by transfusions. Another pregnancy inadvisable.

Case No. 6. Mrs. R. F.

1st Pregnancy—1944, section, baby healthy.

2nd Pregnancy—1946, father Rh positive, mother Rh negative.

Antibodies found December 18, 1946. Section at eight and a half months, December 28, 1946. Baby lived three days, transfused several times. Autopsy showed hemorrhage into lungs, possibly due to overtransfusion.

Case No. 7. Mrs. H. S. F.

Wife Rh negative, husband Rh positive.

1st Pregnancy—1943, 6 lb. 4 oz. baby, healthy, Rh positive.

2nd Pregnancy—1944, stillborn, edematous, autopsy showed erythroblastosis, baby's blood reported Rh negative. Probably an error. Baby dead four days before delivery, autopsy and blood test thirty-six hours after delivery. Antibodies (blocking) still present in mother's blood thirteen months after delivery.

3rd Pregnancy—1948, expected date of delivery March 11. Antibodies present throughout, titer not reduced by treatment with ethylene disulfonate. Section on January 28, 1948, because of pre-eclamptic toxemia. Tentative diagnosis hydrops fetalis. Baby died day before section. Baby very hydropic, wt. 2900 Gm., placenta weighed 2300 Gm. Autopsy, erythroblastosis, baby Rh positive, blocking antibodies in blood. Patient sterilized at section.

Case No. 8. Mrs. A. J. F.

Mother Rh negative, father Rh positive.

1st Pregnancy—1936, 7 lb. 13 oz., healthy.

2nd Pregnancy—1939, 9 lb. 10 oz., healthy.

Transfused nine times after this delivery because of septicemia. This was before discovery of Rh factor, some of the blood was probably Rh positive.

3rd Pregnancy—Delivered July 27, 1947, erythroblastotic child, Rh positive, lived twelve hours. Hydramnios present. Mother's blood seventeen days before delivery negative for Rh agglutinins, positive for moderately strong blocking antibody.

Case No. 9. Mrs. P. H.

Mother Rh negative, father Rh positive, homozygous.

1st Pregnancy—1943, 5¼ lb. healthy baby, Rh positive.

2nd Pregnancy—1947, delivery February 12. Mother had antibodies in last two months, titer increasing, prognosis for baby considered poor.

Delivered at term, 5 lb. 2½ oz., mild icterus, two transfusions, baby lived; Rh positive, no antibodies in baby's blood.

Case No. 10. Mrs. L. C. H.

1st Pregnancy—1939, term baby, normal.

2nd Pregnancy—1940, Cesarean section in Texas for placenta praevia, term baby, healthy.

3rd Pregnancy—1942, Section by E. L. K., term baby, healthy. No Rh test.

4th Pregnancy—1946. In fifth month found to be Rh negative, with some blocking and agglutinating antibodies. Husband Rh positive. Antibodies increased steadily. Section ten days ahead of estimated date of confinement. Baby hydropic, weighing 2925 gm. (placenta not weighed), lived



one hour. Autopsy—Erythroblastosis.

Case No. 11. Mrs. V.

1st Pregnancy—1930, premature 6 lb., living, Rh positive, jaundiced at birth.

2nd Pregnancy—1932, Miscarriage, 3½ months.

3rd Pregnancy—1934, premature, 7½ months, 4 lb., lived five days. Cause of death not known.

4th Pregnancy—1936, term, 5¼ lb., two transfusions from father, living, Rh negative.

5th Pregnancy—1941. Term—Intrauterine death two or three days before delivery. Autopsy?

6th Pregnancy—1942, slightly premature, 5¼ lb., no jaundice, living. Rh negative.

7th Pregnancy—Baby was delivered by section on August 13, 1946. Mother's serum showed no antibodies May 27, 1946, conglutination test positive 1:128, blocking test positive, 1:64. Baby was healthy and was found to be Rh negative. Had to explain presence of antibodies in maternal blood. (Husband is Rh rh).

Another puzzler similar to Case 4.

Case No. 12. Mrs. E. W.

Mother Rh negative, father Rh positive.

1st Pregnancy—1939, healthy 7 lb. 9 oz.

2nd Pregnancy—1942, healthy, 7 lb. 10 oz.

3rd Pregnancy—Due about October 2, 1947.

Mother's blood August 22, 1947, strongly positive for Rh agglutinins and blocking antibody.

Section September 17, 1947, account titer of antibodies and no progress after fifteen hours of labor.

Baby hydropic, Rh positive, was transfused, did not survive.

#### CONCLUSIONS

1. All pregnant women should be tested for the Rh factor, if possible. This is especially important for the multigravida.

2. If the wife is Rh negative, the husband should be tested also. If he is negative, there will be no trouble.

3. If the wife is a multigravida, and the husband is positive, she should be tested for antibodies at monthly intervals from the fifth month on. If none are found the prognosis for the baby is good. If the antibody titer is low, and does not rise, the prognosis is still good. In case of a rising titer, the prognosis is not good.

4. Induction of labor or cesarean section two or three weeks before term is of little value.

5. If the husband is heterozygous, 50 per cent of his children will most probably be Rh negative, and hence are not in danger. If he is homozygous, and his wife has had one or more erythroblastotic babies,

there is little chance of a healthy child in a subsequent pregnancy.

6. Babies clinically erythroblastotic should be transfused as often as indicated, using 20 to 30 cc. of compatible Rh negative blood each time.

7. Rh negative females requiring transfusion should receive only Rh negative blood.

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### STREPTOMYCIN IN THE NEGRO WITH TUBERCULOSIS\*

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Tuberculosis in the negro represents a relatively more serious and a more toxic disease than it does in the white race. The negro does not seem to have a natural resistance to tuberculosis. As a result, the type of cases seen in the negro hospital wards invariably represents a stage greater than minimal in almost 100 per cent of the cases. A substantial percentage are far-advanced cases, and many are complicated by tuberculosis laryngitis and pneumonitis.

From a curative outlook, our present therapeutic routines are, as often as not, of no avail in the negro with tuberculosis. Therefore, any procedure or drug that might act to stabilize, resolve, or cure the disease process, whether used alone or in conjunction with other procedures, is worthy of a full trial. Since streptomycin has been given sufficient clinical observation to indicate that it gives excellent

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clinical results, both palliatively and therapeutically, in certain types of tuberculous infections, its use is all the more indicated and needed in the negro with tuberculosis.

Unfortunately, this is easier said than done. Because of budget limitations, the hospital supply of the drug for tuberculous patients is allocated on an individual basis and final approval has been received for but very few patients, regardless of color. As a result, it has been necessary to have the patients purchase the drug themselves, whenever the staff has felt that the drug was indicated. Even though its usage has been severely limited by the staff, the economic status of most of the Negroes in the tuberculosis hospital wards precludes its use in almost 50 per cent of the cases. A dosage of 1 gm. per day of streptomycin<sup>1, 2</sup> has been shown to be effective in tuberculosis therapy, and at the same time to be less toxic and to produce less disturbance in the vestibular function.<sup>3</sup> Because of the economic factors involved, the smallest effective dosage of streptomycin is desirable in these negro patients. Therefore, the dosage finally determined for usage was 0.5 gm. twice a day, and in some instances of long periods of administration the dosage was decreased to 0.25 gm. twice a day for maintainance.

The use of the drug has been limited almost exclusively to the treatment of tuberculous pneumonia (both alone and as an adjunct therapeutic agent), as an adjunct with thoracoplasties, in the treatment and control of contralateral spreads and for tuberculous laryngitis. A total of 15 negroes have received streptomycin, some still receiving the drug, including 7 males and 8 females. The ages vary from 20 to 61.

The treatment of tuberculous pneumonias has been a great problem in the negro. Regardless of whether one uses bed rest, pneumothorax, phrenic crush or pneumoperitoneum, individually or in combination, the results have not proved consistently effective in stabilizing the

pneumonic process. In almost all instances, the disease progresses rapidly to a fatal end. Four cases in this series were diagnosed as having tuberculous pneumonia and were given streptomycin as part of the therapeutic regime. There were 2 males and 2 females. One male had a lesion which was definitely stabilized, and probably improved, after two months of streptomycin in a dosage of 0.5 gm. twice a day. After this period, a thoracoplasty was started, but has not been completed, as of this date. The streptomycin is being continued until the surgery is completed, and at the present the lesions gives no evidence of extension or contralateral spread. The other 3 patients received pneumothorax as a specific therapy, and streptomycin was given as a supportive measure to prevent extension and contralateral spread. All were given 0.5 gm. twice a day prior to instituting pneumothorax. In all 3 instances, the pneumothorax was considered unsuccessful because the upper lobe was adhered and not amenable to pneumolysis. The 3 patients are now to be prepared for thoracoplasty and streptomycin will be continued as an adjunct to the surgery. Although the period of observation in each case has been relatively short, the drug has apparently prevented the usual contralateral spread, and fatal termination, in all 3 instances. As a rule, such a complication would have occurred by this date in the usual control case. The 4 cases include an age variance of from 25 to 47, so that age apparently plays no part in the results.

Seven cases of tuberculous laryngitis, three males and four females, were given streptomycin in a dosage of 0.5 gm. twice a day. The length of the treatments varied from eighteen to fifty-five days, averaging mostly thirty to forty days; the amount of streptomycin administered varying from 9 to 28 gms. and averaging about 15 to 20 gms. A review of the results shows that all 4 of the female cases received excellent symptomatic relief, and definite pathological improvement was

demonstrated by comparative studies, before and after the drug, as visualized by direct laryngoscopy. Of the males, only 1 received any definite symptomatic relief

with confirmation by laryngoscopy, the other 2 showing only slight improvement clinically and by laryngoscopy.

Two females, age 30 and 32, are re-

CHART OF PATIENTS RECEIVING STREPTOMYCIN

CASE	AGE	SEX	STREPTOMYCIN		DIAGNOSIS	RESULTS AND COMMENTS
			DAYS	GMS.		
F. J.	32	F	90	90	Contralateral spread after thoracoplasty	No drug with thoracoplasty: large cavity completely closed, with a small residual infiltrate after 60 days of streptomycin
J. R.	35	M	42	42	Tuberculous laryngitis	Very slight symptomatic relief; complicated by TB endobronchitis
E. T.	25	F	55	55	Tuberculous laryngitis	Excellent symptomatic relief; complete resolution by laryngoscopy
E. B.	40	F	40	40	Tuberculous laryngitis	Marked symptomatic relief; received drug and then deserted
A. J.	53	M	36	36	Tuberculous laryngitis	No symptomatic relief; no improvement by laryngoscopy
V. S.	25	F	83*	139*	Tuberculous pneumonia	Stabilized by streptomycin; PNX unsuccessful; to have thoracoplasty
P. B.	42	M	64*	64*	Tuberculous pneumonia	Stabilized by streptomycin; thoracoplasty started, without spread or extension to date
V. L.	61	F	28	28	Tuberculous laryngitis	Marked symptomatic relief; complete resolution by laryngoscopy
J. F.	23	M	68*	64*	Large cavity on one side and infiltrate on other side	infiltrate completely cleared and cavity much smaller after 60 days of streptomycin; prepared for a thoracoplasty as dosage decreased
A. B.	20	M	32*	26*	Unexpandable lung after PNX	No contralateral extension after 2 stages of thoracoplasty
M. A.	22	F	30	30	Tuberculous laryngitis	Marked symptomatic relief; marked improvement by laryngoscopy
W. C.	33	M	16	16	Tuberculous laryngitis	Excellent symptomatic relief; definite improvement by laryngoscopy
A. A.	47	M	45*	45*	Tuberculous pneumonia	Stabilized by streptomycin; thoracoplasty to be performed after unsuccessful pneumothoraces (due to broad adhesions)
E. C.	34	F	32*	32*	Tuberculous pneumonia	
R. T.	30	F	30*	30*	Contralateral spread after thoracoplasty	No drug with thoracoplasty; spread stabilized by streptomycin; PNX to be started and streptomycin continued

\*Course of streptomycin not completed.



ceiving 1 gm. of streptomycin a day, in divided doses for the treatment of contralateral spreads which occurred subsequent to thoracoplasties. Neither had received streptomycin with the original thoracoplasty. In the first case a contralateral spread with a large apical cavity developed two years after the original thoracoplasty (Figure 1). After 60 days of

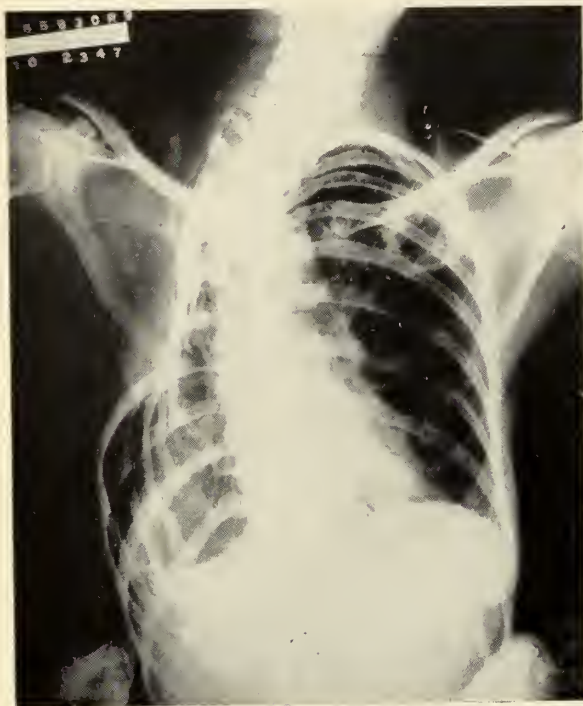


Figure 1. Contralateral apical cavity developing two years after thoracoplasty.

streptomycin, in a dosage of 0.5 gm. twice a day, the cavity closed completely and a small residual infiltrate remained (Figure 2). In the second case, a contralateral spread occurred six months after surgery. Thirty days of streptomycin in a similar dosage, resulted in stabilization of the contralateral lesion and probably some regression. The drug will be continued for another sixty days.

As a therapeutic adjunct to thoracoplasty, 2 males were given streptomycin to prevent a contralateral spread. Past experience has shown this occurs during, or immediately after, most of the thoracoplasties performed in the negro. This seemed to result in spite of the fact that



Figure 2. Same cavity closed after sixty days of streptomycin therapy.

extreme caution had been exercised in selecting cases for this type of surgical procedure. One patient received the drug for a month prior to the operation and has just completed the second stage of the surgery. The original dosage of 0.5 gm. has now been reduced to 0.25 gm. for maintenance. As of the present date, there is no indication of any contralateral extension. The other patient originally had a large cavity on one side, (which was the side for surgery), and a large area of infiltration on the other side (Figure 3). After sixty days of streptomycin in a dosage of 0.5 gm., twice a day, the area of infiltration has completely cleared and the original cavity is now much smaller. (Figure 4). Surgery will soon be started, and the streptomycin is being continued in a reduced dosage for an additional thirty days.

#### DISCUSSION AND SUMMARY

Because tuberculosis in the negro represents a far more serious problem than it does in the white race, an effort has been made to evaluate the results of streptomycin given to negro patients in a public





Figure 3. Large cavity and extensive infiltrate prior to streptomycin therapy.



Figure 4. Infiltrate cleared and cavity smaller after sixty days of streptomycin therapy.

hospital ward. Fifteen negroes with tuberculosis were given streptomycin, as part of their therapy, in a dosage of 0.5

gm. twice a day initially, and in a dosage of 0.25 gm. twice a day, as a maintenance dosage in several instances.

An evaluation of the results shows that remarkable results have been obtained in stabilizing tuberculous pneumonias, when the drug is used as an adjunct with either thoracoplasty or pneumothorax. Similar excellent results have been obtained when the drug is used as a means of preventing contralateral spreads in patients undergoing thoracoplasties, and as a therapeutic agent in contralateral spreads occurring subsequent to thoracoplasties which were performed prior to the time streptomycin was available.

The results in tuberculous laryngitis have been encouraging but not spectacular, although one would have expected the best results in this type of patient. The fact that most of these patients were such far-advanced cases probably prevented more startling improvement in this condition.

Results seem to show no differentiation with regards to sex or age. Streptomycin was used only as an adjunct part of the therapeutic regime, and not as the sole therapeutic agent for the tuberculous infection.

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#### MORTON'S TOE

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Morton's toe is a chronic, disabling, clinical entity characterized by severe paroxysmal pain in the region of the fourth metatarsophalangeal joint. This syndrome is caused by tumefactive lesions involving the most lateral branch of the medial plantar nerve in the region of its bifurcation at the web between the third and fourth toes, and most probably results from the chronic trauma of ill-fitting shoes. Proliferative fibrosis of the nerve is a constant micro-

scopic feature. The exact histological classification of this lesion is too controversial to include in this presentation.

#### CLINICAL FEATURES

In the typical case, the patient complains of pain in the plantar aspect of the base of the fourth toe. The pain is severe, paroxysmal, usually radiates into the fourth toe, and occasionally the other toes. It may be burning, shooting, stabbing, or "like an electric shock." The attacks may last from several minutes to several hours in severe cases, are usually unaffected by any immediate therapy, and disappear spontaneously. Many patients in an effort to obtain relief, rest, remove the shoe, and massage the toe with occasional success. Walking at times is impossible. Numbness and tingling of the fourth toe may be present. At times the pains may radiate up the leg and thigh. With time the attacks increase in severity, frequency, and duration. Involvement is usually unilateral but not infrequently bilateral. In bilateral cases, the clinical onset in one foot is followed in the other by an interval of months to many years.

The most constant finding on examination is severe localized tenderness produced by digital compression deep in the web between the third and fourth toes. Quite often the radiating pain, if present, will be reproduced in this manner. Of extreme importance is the frequent presence of hypesthesia to pin-prick of the adjacent surfaces of the third and fourth toes. The tumor mass is rarely palpable. Occasionally pain is elicited on passive dorsiflexion of the third and fourth toes.

#### ANALYSIS OF CLINICAL MATERIAL

This presentation is based on a study of 12 patients who had surgical exploration of the lesion. Three patients had bilateral involvement. Five other patients with typical features refused operation and are not included.

All patients were white. Eight patients were female and four were male. Nine cases were unilateral and three bilateral. The left foot was affected in 8 instances and the right in 7. The ages varied from 24 to 66, with an average age of about 35 years. The

duration of symptoms ranged from eight months to twenty years, with an average of about two years. In only 2 instances were the complaints atypical. Both patients were referred for sciatica, one bilateral and the other unilateral. It is interesting to note that in both cases, the direction of radiation was cephalad.

On physical examination, classical tenderness was elicited in all but one patient. In the unilateral cases, hypesthesia to pin-prick was noted in 6 instances and absent in 1. Two cases were not tested. In bilateral cases, it was present in both feet in one case, present in one foot and absent in one foot in one case, and absent in both feet in one case. Collectively, it was present in 9 of 13 feet tested. A tumor mass in the web between the third and fourth toes was palpated with certainty in only one patient. Deformities such as pes planus, and hallux valgus were noted in several cases. Bilateral plantar callosities beneath the metatarsal heads were present on only one occasion.

Radiographic examination of all feet included in this series failed to reveal any significant findings. (However, 2 other cases with typical clinical characteristics presented evidence of a degenerative arthritis localized to the fourth metatarsophalangeal joint. Unfortunately, exploration was not done in either case).

Routine laboratory examinations were essentially negative and all patients were seronegative.

Novocain infiltration of the web between the third and fourth toes was of value in differential diagnosis in doubtful cases. If symptoms were relieved immediately after infiltration, operation was indicated.

Conservative treatment was not considered in view of the pathological nature of the lesion. Furthermore, every patient had every conceivable type of non-operative therapy without relief. Operation was performed under local, spinal, or general anesthesia through either a dorsal longitudinal web incision or a transverse plantar approach distal to the heads of the metatarsals. The latter was used to explore the branches entering several webs. In every



case, the branch of the medial plantar nerve to the third and fourth toes was found to be enlarged in the region of its bifurcation. In some instances, it consisted only of fusiform thickening of the nerve proximal to its bifurcation. In others, a distinct nodular tumor mass involving the distal end of the nerve and its bifurcation was found. All lesions were excised and subjected to histological examination. These features will be presented in a subsequent publication. The largest lesion measured 1.5 by 1.0 by 0.4 cms. The smallest measured 0.8 by 0.4 by 0.3 cms. The size of the lesion bore no relationship to the duration and severity of symptoms.

All wounds healed *per primum* and the patients were ambulatory between the eighth and twelfth day. Postoperative numbness of the third and fourth toes rapidly disappeared except in one case. Ten patients, including three with bilateral involvement have been followed for over a year. Relief has been maintained in every case. Of the remaining two patients, operated within the past year, one patient still complains of pain in the operative scar on the dorsum of the foot.

#### ILLUSTRATIVE CASE REPORTS

*Case 1.* A 33 year old white female complained of pain in the plantar aspect of the base of the right fourth toe of eight months' duration. The pain became increasingly severe, radiated into the third and fourth toes and "burned something awful." At first relief could be obtained by changing into bedroom slippers. Later no treatment afforded any relief. On examination, severe tenderness was elicited in the web between the third and fourth toes of the right foot. A small tender mass the size of a pea was palpated deep in this web. Hypesthesia of the adjacent surfaces of the web between the third and fourth toes was present. X-ray and laboratory studies were negative. Operation through a dorsal web approach under local anesthesia revealed a nodular tumor involving the distal end of the most lateral branch of the medial plantar nerve and measuring 0.8 by 0.4 by 0.3 cms. Wound healing was uneventful. The patient was

completely relieved of symptoms. She remains asymptomatic one year after operation.

*Case 2.* A 24 year old white female complained of severe pain in the left forefoot of one year's duration. The pain involved all the toes except the great toe and was associated with numbness of the toes. The attacks occurred daily and lasted several minutes to several hours. Partial relief was occasionally obtained by rubbing the toes. About a month before examination, similar symptoms developed in the right foot. Examination revealed tenderness in the web between the third and fourth toes of both feet. Hypesthesia was only present on the left. Bilateral tender plantar callosities were present beneath the metatarsal heads. Under pentothal anesthesia, both feet were explored through transverse plantar incisions exposing all of the webs. Typical fusiform lesions were found bilaterally between the third and fourth toes. Her postoperative course was uneventful and the patient was completely relieved of symptoms except for persistent numbness of the right fourth toe.

*Case 3.* A 32 year old white male was referred for sciatica. He complained of pain in the right foot radiating up the right leg and thigh. For several years he had suffered pain beneath the right fourth toe and had worn all types of metatarsal pads and shoe corrections without relief. During the past two weeks the pain became so severe, that he was forced to walk on the outer border of the foot. Examination was negative except for tenderness deep in the web between the third and fourth toes. No sensory changes were noted. Diagnostic novocain infiltration afforded complete relief for two hours. Exploration under local anesthesia through a dorsal web approach revealed a nodular tumor involving the nerve and wedged beneath the heads of the third and fourth metatarsals. Excision yielded complete relief of all symptoms.

#### SUMMARY

The characteristic features of Morton's toe, a painful clinical entity affecting the fourth toe, have been described. Surgical exploration in a series of 12 cases with involvement of 15 feet has consistently revealed a tumefactive lesion involving the most lateral branch of the medial plantar nerve in the region of its bifurcation at the web between the third and fourth toes. Excision of the lesion resulted in relief of preoperative symptoms in every case.



## DIAGNOSIS AND TREATMENT OF COMMON VESICULAR LESIONS OF THE HANDS AND FEET

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We have selected this particular group of dermatoses as the subject of this paper because of its high incidence, the annoying incapacity that it occasions, and the high cost to the patient. Moreover, at this season of the year there is a sharp increase in the number of cases. Because patients so often seek relief by the use of home remedies obtained from drug stores, or well-meaning friends, they frequently develop long term eczemas which force them to accept lesser positions in their business or professional life, and to give up sports and hobbies.

This discussion will include only those lesions which exist primarily on the hands and feet, as the site of predilection, and not those which are simply part and parcel of an eruption elsewhere.

### CLASSIFICATION:

1. *Hyperhidrosis*—Characterized by excessive sweating of the hands and feet, sometimes by the presence of fluid between epidermis and dermis.

2. *Pompholyx*, also called dyshidrosis, nervous or toxic rash. Characterized by symmetrical, deep-seated, sago seedlike vesicles along sides of fingers and toes.

3. *Fungus Infections*, vesicular type—Characterized by a picture that is strikingly similar to pompholyx, proved by the pres-

ence of fungus on scrapings or culture from lesions on the feet. Sometimes accompanied by "ids".

4. *Erosio Interdigitalis Blastomycetica*, yeast infection due to *Monilia albicans* plus soap and water—Characterized by wet, moist erosions between the fingers with elevated vesicular borders, paronychia and eponychia.

5. *Bactriids*—Characterized by a palmar and plantar pustular eruption. Lesions at first clear, becomes milky white and pustular, 1 to 5 mm. in size.

6. *Dermatitis Venenata*—Characterized by patchy, grouped, small superficial vesicles over dorsum of hands or fingers (as with rubber gloves) on dorsum of feet (due to shoes, nylons, etc.).

7. *Infectious Eczematoid Dermatitis*—These are the chronic recurrent eruptions that Unna, Engman, and more recently Lane, have written about. The original cause has been lost sight of and sensitization and infection have resulted.

### HYPERHIDROSIS

Patients with hyperhidrosis are less of a problem in civilian life than they were in the Armed Forces. There are several reasons for this: First and foremost, the condition was greatly aggravated by heavy closed shoes, hot weather, and long fatiguing marches. This factor, plus the psychic trauma of combat warfare was enough to produce very aggravated cases of this condition. In extreme cases the entire plantar surfaces of the feet, together with an area halfway up the foot would be covered with bluish white, macerated skin, with fluid separating the epidermis and dermis. The fluid could be shifted about over a large area by palpation. The odor of the feet was terrific and the feet were cold and clammy to the touch. Severe cases were hospitalized and treated with 10 per cent formalin soaks. At first, severe cases were returned to the zone of the interior. Later on these were placed on limited duty overseas. A few were completely relieved by lumbar sympathectomy. These were the cases most subject to trench foot, and conversely, very severe hyperhidrosis

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was a frequent sequela of trench foot. In civilians, this is manifested by excessive sweating, cold, clammy, wet, bluish, odoriferous feet, and seldom by fluid separating the dermis and epidermis.

#### POMPHOLYX OR DYSHIDROSIS

Dyshidrosis was the term applied to this condition, because of the association of the disease with hyperhidrosis, by Tilbury Fox in 1837, who assumed incorrectly that the vesicles were the result of obliteration of the sweat ducts.\* In pompholyx an eruption occurs on the sides of the fingers and toes, with scattered palmar and plantar patches. The vesicles that compose the eruption are deep-seated, thick-walled lesions, which are filled with a thick, clear, serous fluid, which becomes milky. Explosively recurrent outbreaks are usually typical for a given patient. Some present the disease only during times of stress and strain, others during hot, humid weather, others at each difficult menstrual period. Along with a great variety of causes most of which are associated with nervous exhaustion, much credence is given to a psychosomatic association in this condition. The symptoms are intense at times with burning, itching, and swelling of the fingers (and therefore stiffness). It is unaccompanied by epidermal allergy (patch tests are negative). The lesions regress rapidly in five to ten days, the vesicles which are superficial, rupture, and dry up and the deeper ones absorb in situ, leaving a brown discolored spot.

Treatment: Local therapy should consist only of cool, boric acid, or Burrows' solution (1-10) soaks for ten to fifteen minutes twice daily. Avoid the use of fungicides, ointments and greases in the acute stages of the disease. Lassars' zinc paste should be employed until the acute stage has subsided. Attention to the internal aspect of therapy in this condition will require more thought than local therapy. The psychosomatic aspect should be investigated and indicated therapy instituted. Mild sedatives, such as phenobarbital are of great value in this condition.

\*Becker and Obermayer, *Modern Dermatology and Syphilology*. 2nd Ed. 1943.

#### FUNGUS INFECTIONS OF THE VESICULAR TYPE OF THE HANDS AND FEET

In our section of the country, the incidence of this type of eruption is relatively high. There is a sharp increase in the number of cases in hot, humid weather, especially if the hot humid weather is prolonged. This precipitates not only numbers of new cases, but greatly aggravates the current ones and causes yearly relapse. There are many difficulties to the differential diagnosis, especially from pompholyx. There are a few points of differentiation—the only sure way is the positive identification of the fungus on scraping or culture. Fungi are readily found in scrapings or culture from the lesions of the feet; however, it is unusual to find them in the lesions of the hands. These lesions are most commonly considered "ids". We use the same treatment as in the acute cases of pompholyx. After the acute phase, we have found that Desenex, Sopronol and Quinolol Compound Ointments used at night to affected areas of the feet are helpful.

#### DERMATOPHYTIDS

These are the scattered, grouped, pinpoint, superficial papulovesicular eruptions which are extremely pruritic and occur on the arms, upper trunk, face and neck. They are complications of an active fungus infection and are most apt to be present in patients with a vesicular type of fungus of the feet. This occurs especially in the acute stage after the injudicious use of fungicidal ointments.

Penicillin reactions cause an acute vesicular eruption. One of the more common types of penicillin reactions is manifested by a vesicular eruption not unlike that seen in pompholyx and fungus infections. This comes on during the first thirty-six to forty-eight hours following penicillin therapy. It is not a severe enough complication to warrant discontinuing the drug, and disappears within a few days after the medication is discontinued.

In many cases we find secondary infection by staphylococcus and streptococcus. In some of these we use penicillin. Because of the close relationship between fungi and penicillin, a violent reaction gives credence





Figure 1. Case No. 1, showing dermatophytids.

to the fact that in that particular case at least, the original cause of the condition was a fungus.

*Case No. 1.* Colored male, age 10, with an eruption on the arch of both feet, of eight days' duration. It began as deep blisters which appeared suddenly. He had received no therapy. Four days later he developed a rash on the arms, face, trunk and head, which itched severely.

Examination revealed deep-seated vesicles most of which were in the process of drying and others appeared as pigmented macules located on the arches of both feet. There were also grouped papulovesicular crusted lesions over the trunk, extremities and face.

Scrapings and cultures for fungus were positive from the feet.

#### BACTERIDS

This type of dermatosis is not often given a classification of its own, for there are many who believe that this is a subgroup of the infectious, eczematoid dermatitis. There are some of us, however, who believe that it is a true symptomatic condi-

tion, due to a focus of infection. The chief argument in favor of this stand is the temporary flare-up with ultimate cure when the focus is successfully removed. It presents a dermatosis composed of rather large vesicles which soon become pustular, on palmar and plantar surfaces. It is not common that we have a clear-cut case of this condition.

#### EROSIO INTERDIGITALIS BLASTOMYCETICA

This is an eruption which is found on the folds between the fingers. It often starts in the space between the ring and middle finger, and very often beneath the rings, because of soap accumulation. It is also an occupational disease for those who are exposed to soap and water, such as soda fountain workers, and bartenders. It starts as a raw area with small vesicles scattered usually on the periphery which soon rupture and give the margin a loose, sharply defined, undermined edge. Smears from these lesions reveal the typical budding spores.

Treatment: Strict avoidance of soap and



Figure 2. Case No. 1, showing vesicular lesions from which a positive scraping and culture for fungus were made.



water, mild soaks of cool potassium permanganate, boric acid, or Burrows' solution, followed by the application of 1 per cent aqueous solution of gentian violet.

#### DERMATITIS VENENATA (CONTACT DERMATITIS)

This is a patchy, sharply demarcated, erythematous, fine vesicular eruption, usually appearing on the dorsa of the hands and feet. The most common offending agents are leather, shoes, nylon stockings, rubber gloves, dye, and fungicidal drugs. Diagnosis is made from an accurate history, patch tests, or deliberate contact with the suspected substance. A negative patch test does not prove that the patient is not sensitive to the substance used, but a positive patch test is reasonably good evidence.

*Case No. 2.* White male, age 24 years, with a chronic, recurrent eruption, confined to the dorsal and medial aspects of both feet, of two years' duration. Previously treated for fungus infection on numerous occasions. He presented a sharply defined, erythematous and scaly eruption, at the sites mentioned above. Laboratory tests were negative except for positive patch test to the leather from his shoes. Deliberate exposure to his shoes produced recurrence of the lesions, after having been cleared.



Figure 3. Case No. 2. Dermatitis venenata due to leather.

*Case No. 3.* White male physician (general practitioner) age 52, had a persistent eruption on the dorsa of both hands for the past eight years with a definite contact history associated with wearing rubber gloves. The eruption consisted of an erythematous, papulovesicular and scaly weeping eczema limited to the dorsa of both hands and

fingers. Clinical cure was obtained with the use of Neoprene gloves to which he was patch test negative.

#### INFECTIOUS ECZEMATOID DERMATITIS

This is a group of vesicular dermatoses in which we, as dermatologists, are deeply interested. It is a chronic, recurrent, vesicular eruption of the hands and feet that seldom presents the same history or clinical picture. These dermatoses in origin are probably pompholyx, dermatitis venenata, fungus, or any one of the aforementioned conditions and others. Many now believe in the original theory of Unna that the condition is one of infection. It is our plan for the future to carry on further studies in an attempt to learn more about the condition in order to stabilize our therapy.

The clinical picture as quoted from Lane *et al*\* is similar to that which we encounter. "There has been a great variation in the type, arrangement, distribution, and extent of the lesions seen in these patients; some show a minimum of involvement with a few scattered vesicles on the lateral aspects of one or more fingers, others show a generalized papular vesicular eruption, covering almost the entire area of both hands and at the same time extending to the forearms. Most frequent sites of beginning of the eruption seem to be lateral and dorsal aspects of the fingers, uni or bilateral. It usually starts as a patchy eruption which may or may not become confluent or diffuse. One of the first symptoms is pruritis. There is usually peripheral extension of the patches, with a tendency toward a concentration of the vesicles at the edges of the lesions. Rupture of vesicles results in a serous exudate and formation of crusts. Pustules are frequently seen. Palmar vesicles are deeper and have undermined edges."

*Case No. 4.* White female, married, age 34. History of eruption beneath the wedding ring, recurrent each summer for the past six years. This summer, patient presented a rash of four days' duration, which was of sudden onset and involved

——\*Lane, C. G., Rockwood, E. M., Sawyer, C. S. and Blank, I. H., *Dermatoses of the Hands*. J. A. M. A. 128:987-993, Aug. 4, 1945.

the hands and arms which were greatly swollen and covered with vesicles, ranging from 1 to 5 cm. in diameter. Scrapings and cultures for fungi were negative. She was placed on sulfadiazine, gms. 1, q.i.d., Burrows' soaks 1-10 for 10 min. b.i.d. and instructed to avoid all chemicals and soaps. She returned three days later greatly improved. Because some of the lesions were pustular, penicillin was added to the treatment, 50,000 units every three hours. She returned two days later with the entire process greatly flared up. The penicillin was discontinued but the sulfadiazine and soaks were continued. On her return three days later, the condition had again subsided and she cleared up entirely on this routine in ten days.

Was the original condition due to *erosio interdigitalis blastomycetica* and thus the flare-up indicating a fungus as the etiologic agent?



Figure 4. Case No. 5. Infectious eczematoid dermatitis.

*Case No. 5.* White male 27 years old with history of intermittent vesicopustular eruption of the hands for two years. He had been treated with local measures in the hospital on two previous occasions. Examination revealed vesicles and pustules in the palms and on the sides of the fingers of both hands, with considerable thick crust formation. Scrapings and cultures for fungi were negative, search for foci of infection negative. Patient was placed on boric acid compresses, the lesions were debrided and in addition he received x-ray treatment to the hands. Under this regime the skin at the sites of involvement became free of any vesicles or pustules.

#### SUMMARY

At present our approach in the study and care of these cases is as follows:

#### I. History

- a. Past treatment history — (1) Drugs (2) Reactions (3) X-ray treatments
- b. Seasonal incidence
- c. Exposure to fungus
- d. Occupation and hobbies — (1) Chemical and plant contacts including soaps.

II. Physical examination and search for foci of infection.

III. Character and distribution of lesions.

#### IV. Laboratory aids.

- a. Scrapings and cultures
- b. Skin tests with *Trichonphytin* and *oidiomycin*
- c. Patch tests with suspected contactants.

#### V. Therapeutic response.

The therapy is dependent upon the results of the above investigations. For those specific entities previously discussed we have outlined respective treatment. For this last group which is called infectious eczematoid dermatitis our therapy is as follows:

#### I. General.

- a. Improvement of general health
- b. Correction of predisposing factors.

#### II. Internal Medications.

- a. Sulfonamides
- b. Penicillin.

#### III. Local therapy.

- a. Compresses, cool—(1) Burrows' Solution. 1-10. (2) Potassium permanganate 1-6,000. (3) Boric acid solution 2 per cent.
- b. Topical applications — (1) Lassars' Paste USP.

#### IV. Miscellaneous factors.

- a. Avoid soaps, chemicals, irritants, rubber gloves and immersion of hands in water.

#### CONCLUSIONS

The more common vesicular lesions of the hands and feet have been briefly discussed, and we have outlined our method of diagnosis and treatment of each condition. If not carefully handled, any one of



them may become a chronic affair, and fall into the group of infectious eczematoid dermatitis.

## DISCUSSION

Dr. J. K. Howles (New Orleans): I think Dr. Kennedy should be congratulated on bringing to our attention the most common dermatological condition encountered in this vicinity.

There are a few points I would like to stress: One of my assistants, who had recently started training, mentioned to me that he noticed that rarely do you find a true vesicular eruption of the hands, uncomplicated. On thinking of it, we rarely see uncomplicated vesicular eruptions of the hands. Most of the contact dermatitis we encounter in housewives and other people are occupational dermatoses acquired in their work, principally due to too strong soaps, grease solvents, etc., used to clean their hands.

One point mentioned was that of avoiding rubber gloves. Rubber gloves seem to contain some substance today that irritates. It is not as irritating when one substitutes non-allergic rubber gloves. A simple method, when using rubber gloves in household work is to put on a thin cotton or linen glove under the rubber ones. This absorbs perspiration containing irritating substances which produce reaction on the skin.

Dr. Kennedy mentioned the necessity of opening the vesicles when they occur, in order to cut down secondary infection. No one dies of superficial fungus infection but persons are incapacitated and the morbidity is enhanced by failing to cut down secondary infection by opening vesicles. The areas are going to peel anyway.

Dr. Kennedy referred to fungicidal agents. I am sure he means fungistatic. Phenol is a fungicidal and also a protein digestant. Most fungicidal agents are protein digestants.

Dr. Medd Henington (New Orleans): There was one thing that came to mind when Dr. Kennedy was presenting this paper. That is, I firmly believe that too active a treatment for an acute fungus infection of the feet is in many instances responsible for the "ids" that occur elsewhere on the body, particularly the hands. This has been demonstrated so many times that recently it has been my policy to treat these acute vesicular eruptions of the feet with boric acid compresses and talcum powder during the acute stage. When the condition has subsided somewhat, then we go ahead with the fungistatic medications. We have also found that a small amount of x-ray to the involved parts will reduce the vesicular formation and relieve the itching all of which is gratefully received by the patient.

PREOPERATIVE CARE OF PATIENTS  
FOR INTRAOCULAR SURGERY\*

WALTER STEVENSON, M. D.

QUINCY, ILL.

While the title of this presentation indicates that a discussion of the preoperative care of patients for all types of ocular surgery will be given, I feel that if my remarks are confined to the patient for cataract surgery they will cover fairly well all types of ocular surgery.

This premise involves a great many factors; among these are the type of patient, the age of the patient, the type of family, the associates of the patient, the degree of loss of vision, the general state of health, the refraction, and perhaps many other considerations.

## TYPE OF PATIENT

Explanations that are required vary according to the patient. Some patients may be told that they have lens opacities which will probably become surgical cataracts even when vision is reduced only to 20-25. A stolid sensible individual will be helped by a plain statement of the situation. Such a one is apt to have noticed blurring of vision, that lights, especially at night, disturb him and probably will observe that despite many refractions here, there and everywhere, dissatisfaction with his degree of vision still remains. He should be told that no one can furnish glasses to his entire satisfaction because during the course of the attrition of age everyone develops a certain degree of lens swelling which causes frequent changes in refraction; that in his particular case this has progressed to the point where frequent changes of refraction are apt to take place; that in all probability frequent changes in glasses will be necessary. The present state of vision, or approximately such vision, may be maintained for many years by frequent changes in the strength of his glasses. Furthermore, that useful vision is not necessarily 20-20 or 20-15 vision and that even 20-40 vision is

\*Presented before the Louisiana-Mississippi Ophthalmological and Otolaryngological Society, New Orleans, Louisiana, April 17, 1948.



useful vision. This type of patient will then be satisfied with such advice and return frequently for observation and maintain confidence in his doctor. Finally, this type of patient can eventually be informed if cataract surgery is becoming imminent and he will then accept the decision graciously and gratefully. However, the apprehensive introspective type of patient with a doting family, one who has been frightened by friends, and one who has a fear of cataracts should not be so informed, but a responsible member of the family should be advised of the real diagnosis.

A different problem is presented by the case of a Federal judge who was my golf partner for many years. He had lens changes three years before surgery and constantly complained to me, especially on the golf course, that he would certainly have to go to some other ophthalmologist because I did not seem to be able to furnish glasses to his entire satisfaction. While a part of this attitude was facetious, still he was seriously concerned. This man was a highly apprehensive individual and I knew from the type of cataract he was developing that there would be slow progress. I did not want to throw him into a "tailspin" by telling him the truth about his condition. However, I did tell his wife and in that way controlled the situation. At the proper time I told him of his trouble, told him I had not informed him before and why. When this man came to surgery he was an excellent patient with full confidence in my judgment.

I have another type of patient, that of a wealthy widow who lives with an old maid sister, both the recluse type. This patient, even now, is almost ready for surgery but I have not told her of the seriousness of her condition and she seems well satisfied because the sister has been well informed and is able to control the situation when the patient complains of the doctor who does not seem to improve her failing vision.

I quote from a personal communication from Dr. Meyer Wiener, with whom I was associated many years ago, regarding his attitude about this important feature of ad-

vice to prospective cataract patients.

"There is danger in withholding information about his condition, even if the next of kin is notified. He never has the same confidence in the doctor, feeling that perhaps some information is kept from him. I have told my patients who were nervous and apprehensive that they have an opacity in their lens. That everybody past 60 has opacities; that opacities in the lens are called cataract, but that they seldom advance enough to seriously interfere with useful vision, and if they do, that operation will give them useful vision and that if I had anything interfering with my sight, I would rather have cataract than anything I know, because it is more amenable to treatment. Otherwise, I consider your advice sound."

#### AGE

Certainly it is useless to tell a person of 75 or 80 with 20-40 vision that he may need surgery, particularly if the cataract is progressing slowly. In all probability death will solve all visual problems for this type of patient and, as stated before, so long as 20-40 vision is obtained, surely sufficient vision is present; so why burden such an individual with additional worries?

#### OCCUPATION

One could approach this phase with due consideration. A man of 50 whose livelihood depends upon good vision, and especially one who drives here and there as a business duty, must have better vision than a farmer who may quite easily continue his work with 20-60 vision. This type of patient should be told at once that he is losing vision and that when he is uncomfortable and cannot follow his vocation that surgery is available. Likewise, a housewife can do her work with greater reduction of vision than a woman who is employed in the business world. Obviously, a patient in poor health with vision impaired by lens opacities should not be burdened by a disclosure that cataracts are apt to further disable his vision. Frequent changes of glasses will probably satisfy the patient and some member of the family can be informed that the care of the general health is of greater importance than any local treatment.

#### INDIVIDUAL

The individual patient's reaction to his visual loss is certainly a factor in preoperative care. Whether or not a patient with cataract is to be operated upon, will depend

upon the patient's reaction to his own visual loss. Many patients complain bitterly of vision of 20-40 or 20-50, while others with similar visual requirements for their daily activities are happy with 20-80 or 20-100.

#### REFRACTION

In so far as refraction is concerned, innumerable patients with reduced vision come for observation with less vision than on a previous visit, and yet, for many years visual acuity can be restored to approximately its former state by minor changes in the lenses prescribed.

#### GENERAL HEALTH

The first step in caring for a preoperative cataract patient is to insist on a complete, general physical examination by an expert internist. This is sometimes a difficult problem, for many patients will insist that the examination be made by the family physician who is unqualified to make such examinations, despite the fact that the patient has implicit confidence in him. Therefore, it is unwise and hazardous to select any but competent physicians for such examinations even at the risk of offending the family physician.

Whether or not correction of physical defects inhibits the progress of cataracts, such faults must be corrected and it is my firm belief that in many instances cataract progress has been delayed by correction of physical defects, the administration of tonic medicines, and a change in the health habits of the individual.

Diabetes is not a contraindication. All cataract patients with diabetes should have a careful survey made by a competent internist, and when and if such a patient is stabilized, surgery is almost as safe in this type of individual as in an otherwise normal patient.

Hypertensive cases offer considerable risk to successful surgery. However, with a period of rest in bed, together with appropriate treatment, these cases can in almost every instance be successfully operated upon. The same statement may be made regarding cases of nephritis with high retention of non-protein nitrogen. Under hospital regime, strict diet, etc., these cases

may be controlled. As to the highly neurotic, apprehensive patient, one may quiet his fears by a period of bed rest and judicious use of sedatives. I recall well when I was with Dr. Wiener that he did not consider hypertension a contraindication to intraocular surgery. Again quoting from his recent communication to me regarding this:

"I don't agree with you about the risk in hypertensive cases. I have never had what I thought to be a serious complication due to hypertension. That is a matter of personal equation, however."

Of course a preoperative requisite is careful observation of the intraocular tension, both before and after dilating the pupil. Slit lamp examination of course is a prerequisite. Needless to say one should be extremely painstaking in his search for infections about the eyelashes, lids and conjunctiva. It is a very good practice to irrigate the lacrimal sac with a mild antiseptic before sending the patient to the hospital. It has been said that a dental examination and roentgenogram of all of the teeth should be a preoperative routine. While I am not opposed to this, it many times is not an expedient thing to do. It has been my observation through many years, and particularly in India, that this is not necessary. However, if it is done and any teeth are extracted, surgery should be postponed for at least two months.

#### INDICATIONS FOR SURGERY

When should a patient be urged to have cataract surgery? A wise surgeon will suggest to a cataract patient that he will assume responsibility for surgery when and if the patient requests such surgery. Don't ever urgently advise surgery unless the type of cataract suggests impending glaucoma, provided the patient has reasonably useful vision in the other eye. If, however, the cataract is mature or hypermature, I suggest surgery in such an eye regardless of the state of vision in the other eye. In other words, I leave it pretty much to the patient as to when he would like to have better vision. I usually state that when they are unhappy with their present vision, perhaps are becoming despondent and feel that they can no longer carry on the type of



life they desire, that then is the time to operate. Woe to the surgeon who operates upon an eye very defective in vision with a fellow eye in which fairly good vision is present, say up to 20-50. No amount of explanation before surgery will satisfy that patient when, after complete recovery of the operated eye, he asks, "Doctor, when do I get my glasses?" Despite every possible method to convince him of the fact that he was told that glasses could not be fitted until the fellow eye became more defective the patient does not understand "Why." So, if possible, wait until the fellow eye is so defective in vision that diplopia will not result with glasses.

There are definite exceptions to this. I have in mind a patient who came to me when he was the superintendent of signals for a large railroad system. He was almost totally blind in one eye with 20-20 vision in the other. On one of his annual examinations by the railroad service he was told that he could not remain on duty unless vision was improved in the blind eye. I told this man that he would not be able to wear a cataract lens with the vision as good as he had in the other eye. He said that all he wanted was to be able to sit down with a cataract lens on and pass the examination. This was accomplished by surgery and to my great surprise he appeared in my office sometime later wearing a cataract lens on one eye with a very minor strength lens in the other, stating that he had no difficulty whatever maintaining binocular vision and never had diplopia. I have had this happen a number of times—all of which proves that there are exceptions to everything.

So far as I know there is no definite method of determining the condition of the macula in the eye with a lens so opaque that the fundus picture is obscure. However, if the patient has good light perception, good light projection, and good pupillary reaction to light, together with the ability to recognize red, blue, and green colors through a pin hole, one can feel reasonably sure that the macula is healthy. Dr. Wiener has stated that flashing a strong light in the macular region of the cataract eye will produce a

black central spot as an after-image, if the macula is healthy.

#### PREOPERATIVE HOSPITAL CARE

The patient should be placed in a hospital at least two days before surgery. A complete physical examination should be done again and, while bed rest is not essential before surgery, the hospital environment will be accepted and he will become accustomed to his surroundings, and calmness, so essential to an acquiescent patient, will be established. It is always wise to inquire if the patient has some particular medicine that he is in the habit of taking. Unless seriously contraindicated, by all means let him bring it along and take it. This applies especially to laxatives. Always inquire what laxative a patient is in the habit of using when such medicine is necessary and no matter what type of laxative that may be, that is the laxative that the patient receives. It is our practice to have a culture made of the conjunctival sac secretions and if pyogenic organisms are found surgery is deferred. Yet, through the years of my surgical experience I am convinced that patching an eye is sufficient evidence of cleanliness if a large amount of secretion does not accumulate beneath the patch after twenty-four to thirty-six hours. I do not use conjunctival antiseptics prior to surgery, as a rule, nor do I irrigate the conjunctival sac immediately before surgery. It is my opinion that protective lysozymes in the conjunctival secretion are best left undisturbed.

It is our practice to give each patient 150,000 units of penicillin in wax and oil two hours before surgery, and 150,000 units six hours following surgery. This is accepted prophylactic practice. Twenty-four hours prior to surgery  $\frac{1}{2}$  grain of phenobarbital is given orally three times daily. The face is washed with soap and water three times a day during this period, the hair having been shampooed before entrance into the hospital. A saline enema is given the afternoon before surgery—not the night before or on the day of surgery. At bedtime the night before,  $1\frac{1}{2}$  grains of nembutal or seconal is given by



mouth. An hour before surgery this same dose is repeated. An order prohibiting relatives or visitors in the room before surgery is imperative. My hospital has strict instructions not to disturb the patient until the moment of transportation to the operating room and as little excitement and noise as possible should be assured. Upon entrance to the operating room, noise of pans, conversation, etc., is forbidden and no one is permitted to initiate conversation except the surgeon and no one permitted to give instructions to the patient except the chief actor—the surgeon.

Placed upon the operating table, the patient is again assured that he is a good prospect for surgery, that a successful result is to be anticipated, and that with the exception of a slight pin prick for the initiation of anesthesia, that no pain will be experienced. The patient should be advised why general anesthesia is not practical. The day before surgery the eyebrow is completely shaved and the tips of the eyelashes are clipped off with the scissors dipped in vaseline. It is well not to clip the eyelashes too short.

#### ANESTHESIA

Despite the fact that the incision for cataract surgery is considered the most important factor to a safe and easy delivery of the lens, I personally consider good anesthesia equally important, if not more so. Whether one prefers to use cocaine or pontocaine as a topical anesthetic is a matter of choice. However, whichever is chosen it should be used in the patient's room before the journey into surgery. We use two drops of 5 per cent cocaine hydrochloride solution, five minutes apart, ten minutes before the patient leaves the room. After arrival upon the operating table, 4 additional drops of cocaine are distilled into the eye to be operated upon and 1 drop into the opposite eye. It is well to mention here, as a minor detail, that in dropping an anesthetic into an eye, or as a matter of fact, before dropping any liquid into an eye, one should consider that the closer the dropper is held to the eye the less shock of impact is felt by the patient. I consider this a very important detail. Remember that in most instances

the patient is blind and cannot see what is going on and for that reason cannot anticipate what is to happen. Therefore, the surgeon should tell the patient, in so far as practical, everything that he is about to do before he does it. During this time akinesia is induced according to the method of Cecil O'Brien. This method has always proved entirely satisfactory to me, but there is a trick about its induction. The injection should be made directly forward from the incisura of the ear and about one-half inch from it. If one starts the injection immediately upon entry of the needle and keeps the procaine flowing ahead of the needle, this can be done practically painlessly. The procaine should be 1 per cent with 1 to 100,000 epinephrine chloride. The needle should be forced directly inward until the condyle of the jaw is felt. If the patient is edentulous the mouth should be slightly open in order to place the condyle of the jaw in the proper position. Having felt the bone with the needle point, the needle is slightly withdrawn and at least 4 cc. of procaine injected at this spot. If one keeps the needle in constant contact with the periosteum of the bone a considerable degree of pain will be induced. Therefore, the needle should be slightly withdrawn before injection. Upon withdrawal, gentle massage of the area should be made for three or four minutes. If this injection is to be effective, one will notice in thirty to forty seconds after injection that, while the eyes are closed initially, the lid on the injected side will open about one eighth of an inch and gradually open quite a little more. If this does not take place as stated a second injection should be made at the same point by a needle fanned out in three directions, up and forward, down and forward, and straightforward, injecting an additional 2 cc. of procaine. Following this the patient is directed to look down and 2 drops of procaine are injected just behind the tendon of the superior rectus muscle. Two drops of the same solution are then injected into the skin of the nose just above the inner canthus. Four or five drops are now injected into and below the outer canthus in

the event that canthotomy seems desirable. Through the lower lid below the tarsus and fairly close to the outer canthus 2 cc. of the same solution is now injected behind the globe. The needle should be directed to a point half way between the optic foramen and the posterior surface of the eyeball. To avoid hemorrhage one should adopt the method of injection devised by Harvey Cushing and this is to keep a slight amount of solution flowing from the end of the needle in order to push blood vessels aside. There will be a moderate degree of resistance to this until one feels the needle fall into the muscle cone space. Then 2 cc. of the solution should be injected. A word of warning regarding retrobulbar injection: It should not be done too long before the surgery because the eye may become extremely soft. While I was in India I saw a lens lost into the vitreous on three occasions because of a soft eye made so by retrobulbar injection given too soon. Tincture of merthiolate is now painted over the entire half of the face on the operative side, extending one-half to the opposite side of the nose and on the forehead at least as far across as above the other eye. In painting the lids one should pull the lids to the outer canthus with a piece of gauze in order to tighten the palpebral fissure so as to avoid merthiolate seeping through the fissure. Merthiolate in the conjunctival sac will congest to the eye to the extent that serious bleeding may ensue. Following the instillation of several drops of epinephrine chloride (1 to 1,000) the patient should now be ready for surgery after being draped. We drape the patient as follows: A large towel folded triangularly covers the hair and is held together with a towel clip. A large table cover is placed beneath the head and with the patient's head held above this sheet the eye-mask is placed over the operative eye and this mask is tucked well beneath the patient's head. This latter maneuver avoids displacement of the mask quite thoroughly. Sterile sheets are then draped over the patient's entire body, and the patient is now ready for the surgeon.

## PRIMARY GLAUCOMA NEWER TRENDS IN TREATMENT

CHAS. A. BAHN, M. D.

NEW ORLEANS

Glaucoma ranks third in the causes of blindness to those past the age of forty. Its frequency is about that of diabetes, approximating .1 per cent of the total population and 1 per cent in those past forty. The glaucomatous in this country number between 100,000 and 150,000. Those of the world number approximately 1,000,000 which is almost twice the population of New Orleans.

After more than one hundred years of investigation, primary glaucoma especially still remains ophthalmology's Public Enemy No. 1. Basically, the reasons are simple.

A. Glaucoma has been looked upon in the past as a single one dimensional entity such as a linear inch, with only one cause which was expected to explain all stages of all cases completely. Now we are beginning to realize that no one single cause is or can be completely explanatory in any and all stages of all cases of primary or secondary glaucoma. The causation of glaucoma, like that of other disease processes, is becoming increasingly recognized as being essentially a three dimensional problem, such as a cubic inch. All three dimensions or components exist in all cases, but their relative importance varies greatly in individual cases. These basic components are: Constitution, environment, and time. By constitution is meant the sum or total of hereditary characteristics, the potential basic structural material and functional activity of each cell or/and cell group from conception to death. Environment includes the normal and abnormal physical and chemical influences to which all cells are exposed during their lives. Time includes the life cycle or duration of all body cells both as individuals or groups, in the different stages of life; also their de-

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The author is indebted to Smith, Kline and French and to Merck & Co. for the Furmethide and D.F.P. used.



struction and replacement rate. This three dimensional concept of causation in medicine may seem new, but two thousand years ago it was old. You have probably recognized the parable of the sower and the seed from the New Testament which crystallizes a basic law of all life which medical science has neglected.

B. The causation of glaucoma also largely remained a mystery until the physical and chemical fundamentals of the fluid in-go and out-go of the eye were reasonably understood. Glaucoma is essentially an imbalance between the in-go and out-go of intra-ocular fluids. The airplane was not practically possible until lightweight, efficient power and fuel were available. Similarly, glaucoma advancement in prevention and treatment was not practically possible until intra-ocular mechanics were reasonably understood.

Before looking into the future of glaucoma, a simple prevue of our present conceptions is desirable, especially to non-ophthalmologist physicians. The following concept of primary glaucoma is largely based on the writings of three world authorities on this subject. They are the late M. Schoenberg of New York, A. Busacca of Brazil, and A. Magitot of France. Primary glaucoma is essentially a bilateral progressive constitutional degenerative ocular disease, generally characterized by increased intra-ocular tension, peripheral and central visual deterioration, disc excavation and variable vascular reactions. In varying degrees it involves both the intra-ocular filtering mechanism and the fluid which must pass through that filter to exit from the eyeball. The filtering mechanism is located principally in the cornealscleral junction. The filtering fluid is quantitatively and qualitatively regulated by the retinal and especially the choroidal capillaries and precapillaries which in the glaucomatous are abnormal. This intra-ocular vascular degeneration is only a local part of a general bodily vascular degeneration. Capillaroscopic tests of the subungual capillaries show specific changes in the glaucomatous. These same vascular changes

especially in the thalamic portion of the brain are vitally important. Here sensory impressions from the eyes and the other senses are transformed into the several types of autonomic impulses, including vasomotor. In the glaucomatous, emotional disturbances produce abnormal vasomotor reactions. These centrally and peripherally adversely affect the filterability of the intra-ocular fluids. It has long been known that fear, worry, anger, and anxiety of any form usually aggravate or precipitate glaucoma.

This brings us to the first major advance in the treatment of glaucoma: its hygienic care, prevention or retardation. Irrespective of other treatment, all glaucoma patients should be made to understand clearly and promptly that they must think calmly, act calmly and be calm to potentially retain their sight. Living dangerously to them frequently means dying blind. This hygienic aid to other treatment must obviously be used constructively and practically. It is neither time consuming nor complicated. During approximately five years in which I have successfully used it with hundreds of patients, I have not infrequently marvelled at the success with which the average glaucoma patient can overcome psychologic difficulties that seem almost unsurmountable. The glaucomatous must also learn to practice order and moderation in their daily physical and mental living habits. Moderation in the use of stimulants, especially caffeine, is important.

Before discussing the therapeutic treatments of tomorrow, let us review those of today. Pilocarpine suitably administered increases sweating; some of the bodily secretions become quantitatively increased and are also made thinner and more filterable. Atropine causes dryness of the throat, thus decreasing oral secretion quantitatively and making it thicker and less filterable. The former stimulates the parasympathetic mechanism; the latter paralyzes it. Generally speaking, atropine in the predisposed, therefore, precipitates or aggravates glaucoma while pilocarpine in-



creases intra-ocular filterability and is the most frequently used drug in the treatment of glaucoma. The technicalities of the intra-ocular mimetic mechanism are of so little interest to nonophthalmologists that they are omitted.

Two of the newer and therefore more experimental drugs apparently have the greatest future possibilities. The first is Furmethide, a 10 per cent solution of furfurylmethylammonium iodide (Smith, Kline and French), which clinically resembles pilocarpine, but is more powerful. In higher intra-ocular tensions, that is 35 mm. of mercury or more, it is instilled at fifteen minute intervals for two hours, after which it is instilled three to five times daily. In lower tensions, Furmethide is instilled three to five times daily with or without auxiliary drugs. During more than six months we have used Furmethide in approximately 20 patients whose glaucomas were not reasonably controlled by other miotics and who were poor surgical risks. It has been almost uniformly successful in reducing tension and/or reasonably retarding progress of the disease. In one case tension was very slightly reduced. In 3 other cases the disease slightly advanced during six months, but much less than it had with other treatment. Furmethide is apparently best reserved for patients in whom other miotics are partially successful and as an emergency aid in acute glaucomas. It is not irritating and may be used with other miotics, especially D.F.P.

The second experimental drug of apparent future value is D.F.P. (diisopropyl fluorophosphate, Merck). This powerful miotic of the eserine group is five times stronger than a .02 solution of eserine. Being unstable in aqueous solution it is manufactured as a 1/10 per cent solution in peanut oil. Although locally nonirritating, it should be used as infrequently as practical, ranging from twice daily to twice weekly. Blurred sight from spastic accommodation and transient myopia as well as occasional headaches follow its use. In approximately 20 cases in which we have used this drug, tension was at first usually

promptly reduced; but its tension reducing qualities in at least 4 cases diminished materially during the first three months. It was then discontinued or supplemented with Furmethide, pilocarpine, or other auxiliary drugs. Unfortunately, only clinical tests are as yet available to determine the specific miotic best adapted to any given case.

All primary glaucoma operations are designed to increase the filtration area and/or reduce the aqueous. There have been few or no basic advances in glaucoma surgery during the past decade. Goniotomy is a streamlined de Vincentii operation. When therapeutic and hygienic treatment will apparently not afford any glaucoma patient reasonable sight during life, the surgical risks involved should be considered promptly. Glaucoma progress is measured in terms of peripheral and central vision as well as ocular tension. The success or failure of any glaucoma operation is explained in four questions:

1. Did the operation quantitatively and qualitatively meet the specific needs of the affected eye?
2. Were the risks justified?
3. Was the operation correctly performed?
4. Did the eye survive the operative trauma?

Let us not forget that more than 60 per cent of all glaucoma operations are not successful in normalizing tension and maintaining central and peripheral vision for three years. We should also remember that glaucoma operations do not cure glaucoma. They may normalize tension, but they do not normalize the abnormal quality of the intra-ocular fluid. Among promising techniques of tomorrow are anterior chamber air injections and goniotomy. The former is used at the termination of practically all glaucoma operations to facilitate filtration. The latter is apparently of most value in specific types of infantile glaucoma.

The anterior chamber angle varies more widely in the glaucomatous than in normals and is accurately studied with the gonioscope. The relationships in any specific

case between the depth of the anterior chamber angle and the types of glaucoma (vascular or corneoscleral factor dominance) as well as the most effective type of medical or surgical treatment are not yet sufficiently understood to be of great practical value. Generally speaking, in the narrow angle groups with lower tensions the trend is toward goniotomy and cyclo-dialysis; and in higher tensions, toward iris inclusion operations. In the wide angle group, the same operations are used in lower tensions, and corneosclerectomy in higher tensions. If transient edema is the primary emergency, as in acute glaucomas, sclero-iridectomy is the operation of choice. Obviously, tension should be normalized therapeutically as far as possible before surgery is attempted.

Newer trends in treatment really mean the probable remedies of tomorrow. In their discussion the fact is easily overlooked that the great progress which has been made in the sight conservation of the glaucomatous, especially in the past decade, has not been due to any single, spectacular or epoch-making medical or/and surgical discovery. The most important factor has apparently been its earlier recognition especially by the general public and those who serve in different health capacities often indirectly associated with ophthalmology. Next is the better coördination of our knowledge of its fundamentals as parts in the whole, using more efficient applications of these basic principles in the solution of often complex problems which involve the causation, progress and treatment of any glaucomatous person. In this third stage of glaucoma understanding, the more orderly and effective use of mostly previously known diagnostic and treatment methods is really responsible for our present technical progress. The better hygienic care of the glaucomatous and the preglaucomatous, the experimental use of more potent drugs and minor changes of surgical technics which summarize our newer trends of treatment are important. But even more important is that future progress will largely depend on the solution

of glaucoma problems through the application of basic principles which apply to this disease as a whole, rather than as individual problems largely independent of the fundamentals on which the condition as a whole depends.

In conclusion, the more potent drugs and changes in operative technics are less important among the newer trends in the treatment of primary glaucoma than the fundamentals which have been mentioned. These involve:

A. The possibility of glaucoma as a cause of any symptom involving sight or pain in the eye, face or head, especially in those past forty.

B. In addition to any other examination, especially nonophthalmological, physicians should routinely compare every patient's intra-ocular tension with their own. If there is any difference or doubt the patient should be promptly examined by an ophthalmologist.

Glaucoma blindness is generally avoidable if the disease is recognized early in its course and treated with reasonable efficiency. Although the newer trends in treatment are important steps forward, let us face the fact that the glaucomatous blind will largely depend upon the cooperation of nonophthalmologist physicians who first attend the glaucomatous patient in a health capacity. If you and 100,000 other nonophthalmologist physicians will not forget the frequency and importance of glaucoma, or to apply daily the simple fundamentals in its prevention or retardation, glaucoma will cease to be ophthalmology's Public Enemy No. 1.

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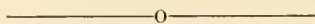
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## ACUTE BACTERIAL ENDOCARDITIS OF SALMONELLA ORIGIN

### REPORT OF CASE\*

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The extreme rarity of bacterial endocarditis of *Salmonella* origin justifies the report of the following case, which was recently observed at Charity Hospital of Louisiana at New Orleans.

### REPORT OF CASE

The history of this 52 year old white man, who was admitted to the hospital August 28, 1947, was secured with difficulty because he spoke and understood no English. So far as could be determined, he apparently had been perfectly well until five days earlier, when he had begun to suffer from "rheumatism" and fever after being caught in a heavy rain. The pain, which was localized in the neck, knees and ankles, was not associated with swelling or tenderness. Two days before admission he had developed pain in the back and chest, which had been continuous, and pain high in the epigastrium, which had been intermittent. He also had suffered from anorexia and malaise, and from a slight, nonproductive cough. The day of admission to the hospital he passed a stool described as "black;" this was the first gastrointestinal irregularity. A "heavy" pain in the neck appeared the same day.

Inquiry into the past history was not revealing. The family history was noncontributory. The patient was a fisherman, who lived in the dock area, where there were "lots of rats." For some time he had suffered from headaches and from occasional "gas" pains. There was a recent history of nocturia (twice nightly) and of increased diurnal frequency. He had had bilateral hernias for

forty years. No history of an insect bite could be secured.

*Physical examination:* A man of about the stated age who seemed chronically rather than acutely ill. Temperature 102° F., pulse 126, respiration 26, blood pressure 110/52. The face was flushed, the skin was dry and hot, and the eyes were bloodshot. Fundusoscopic examination revealed arteriovenous nicking and an increase in the light reflex of the arteries. The nasal mucosa appeared somewhat redder than normal. The few teeth still in situ were dirty and carious.

The chest was barrel-shaped. Loud, moist, bubbling rales were heard over both bases posteriorly and crepitant rales were heard over the midlung fields. There was no change in the voice sounds. The percussion note was resonant to hyperresonant. The heart was not clinically enlarged. The sounds were distant but could be clearly heard. A grade 2 aortic systolic murmur was present. A pericardial friction rub could be heard parasternally in the fourth left interspace anteriorly. The radial pulse was full, bounding and regular. All peripheral blood vessels were thickened.

The abdomen was moderately distended and tympanitic. Peristaltic sounds were decreased. No organs or masses were palpable. Bilateral irreducible inguinal hernias the size of grapefruit were present. The prostate was moderately enlarged. Several internal hemorrhoids were present.

Except for enlargement of the right epitrochlear lymph node, no lymphadenopathy was observed. The patellar reflex on the right was decreased. All other reflexes were physiologic.

*Initial Laboratory Data:* Urinalysis showed a trace of albumin, 1 plus sugar, and 3-4 white blood cells and 1 red blood cell per high power field (centrifuged specimen); the specific gravity was 1.012. Blood study showed 12.6 gm. per cent of hemoglobin; 14,850 white cells per cubic millimeter; 88 per cent polymorphonuclear leukocytes, 8 per cent lymphocytes, and 4 per cent immature cells. The hematocrit reading was 37 mm. and the sedimentation rate 32 mm. per hour (Wintrobe). The Kline and Kolmer reactions were negative.

*Clinical Course:* The patient's clinical course can conveniently be summarized in three episodes, the first dating from admission (August 28) through September 19, the second from that date through September 29, and the third from that date until death, October 11.

*First Episode:* The tentative diagnosis on admission was bronchopneumonia and possible typhus fever. The day after admission the patient, who had not been jaundiced when he was first examined, was definitely jaundiced. The liver, which had not been palpable at the first examination, was now palpable two finger-breadths below the costal margin and was slightly tender. There was dullness over the lower third of the right posterior lung field and more rales were present than on the

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previous day. The pericardial rub, which was still clearly heard, was explained on the basis of a pleuropericardial reaction to pneumonitis. Roentgenograms showed a suggestive enlargement of the cardiac shadow, with infiltration radiating out from the hila, more markedly on the right side and toward the right base. The roentgenographic findings were considered compatible with congestive cardiac failure. Infectious hepatitis and Weil's disease were now considered as diagnostic possibilities.

September 1, the fourth day of hospitalization, the patient had twelve liquid yellow stools during a six-hour period. Examination showed no ova, parasites or cysts, and no pus or blood. By September 4 the stools had become clay-colored and a diagnosis of carcinoma of the ampulla of Vater was briefly entertained, on the ground that the jaundice was of the obstructive type. During this episode the urine contained bile but was negative for urobilinogen in 1/10 dilution. The icterus index reached a maximum of 44.5, then fell slowly to 20.8. The van den Bergh direct reaction was 7.6, September 9, and forty-eight hours later was 12.8. The white blood cells ranged between 15,120 and 9,420 per cubic millimeter. Agglutinations were negative for typhoid (O and H), typhus fever and brucellosis, and two blood cultures were reported sterile. Electrocardiogram was normal (as was a second electrocardiogram on September 29). A study of the gastrointestinal tract with a barium meal revealed no abnormalities of any kind, including no widening of the duodenal loop. The alkaline phosphatase and the serum proteins of the blood were normal.

The patient's temperature during this first episode reached 104.6° F., fell slowly to 99.2° F. on the eighth and ninth days of hospitalization, and then rose again to 102° F. almost daily. The pneumonitis present on admission cleared up within five days, the pericardial friction rub disappeared about the same time, and by September 19, the twenty-third day of hospitalization, clinical jaundice also disappeared. At no time, in spite of the high fever and other manifestations, did the patient seem seriously ill. Two courses of penicillin were given, the first amounting to 480,000 units and the second to 660,000 units. Both courses were discontinued because there was no apparent effect from the medication. The administration of digtotoxin was begun on the third day of hospitalization and was continued until death. Otherwise treatment consisted of a salt-free, high-protein, high-carbohydrate, low-fat diet, supplemented by high dosages of multivitamins and by amino acids.

Second Episode: During the second episode of his illness, which lasted for the ten-day period ending September 29, the patient was clinically free of jaundice; the icterus index was 10.4. The urine was repeatedly negative for bile and was positive for urobilinogen in dilutions ranging from 1/10

to 1/40. The white blood cell count was 18,000 per cubic millimeter on one occasion and 21,840 on another; each count was made shortly after a chill. The stools on two occasions showed larvae of *Strongyloides stercoralis*. Agglutinations were negative for typhoid O and H, paratyphoid A and B, brucellosis, tularemia, and *Proteus* X 19. Smears were negative for malaria. Roentgenograms of the chest showed an elevation of the right leaf of the diaphragm, with the cardiothoracic ratio within normal limits. Amebic abscess of the liver was now considered a possibility. Fluoroscopy, however, revealed both diaphragms normal in position and moving freely and equally with respiration; the costophrenic sulci were clear.

During this second episode the temperature varied from 100 to 102.6° F., usually being nearer the higher level. The patient had, as noted, two chills, after the second of which blood culture was reported positive for *Salmonella*.

Third Episode: September 30 the patient again became jaundiced and the liver again became palpable about 3 cm. below the right costal margin; it was soft and not particularly tender. There was resistance of the right rectus muscle in the upper quadrant and the epitrochlear lymph nodes were enlarged but otherwise the physical findings were normal. There was, however, a peculiar sour odor about the patient, the so-called fetor hepaticus, which is usually associated with advanced hepatic degeneration.

The icterus index was 17.8. The urine was negative for bile and positive for urobilinogen in dilutions of 1/10 to 1/40. A stool culture was negative. The white blood cell count was 21,040, with 80 per cent polymorphonuclear leukocytes.

October 2 the blood culture was again reported positive for *Salmonella*, and although the organism was resistant to streptomycin in vitro in a concentration of 100 mcgm. the use of the drug was begun in dosages of 4 gm. daily and was continued until 20 gm. had been given. There was no perceptible effect on the temperature elevations, which ranged from 101 to 103° F., with one elevation to 105° F.

October 9 the patient had a severe chill and his temperature rose to 104.4° F. For the preceding forty-eight hours he had complained of considerable "gas", and hiccupping suggestive of diaphragmatic irritation. October 11 he became nauseated early in the morning and vomited several times. His condition seemed good, however, and he did not complain of pain. In the evening he went into a state of shock. He vomited dark fluid, which grossly did not contain blood, and he complained of occasional pain across the lower portion of the abdomen, which was tympanitic and rigid. The liver was no longer palpable but liver dullness could be demonstrated immediately below the right costal margin. The mucous membranes were pale and the skin was a curious slate-color. Petechiae were present over the flexor surfaces of the forearms.



Death occurred suddenly, while an infusion was being given.

The clinical diagnosis was infectious hepatitis and *Salmonella* septicemia.

*Necropsy:* Necropsy, which was performed ninety minutes after death, revealed the following data pertinent to this discussion:

The body measured 167 cm. and weighed 122 pounds. Petechiae were present over the flexor surfaces of both forearms.

The peritoneal and pleural cavities were essentially negative. The pericardial cavity was obliterated by fine fibrinous adhesions which were extremely friable and separated easily. The heart weighed 405 mg. The valve measurements were as follows: TV 12.5 cm.; PV 7.5 cm.; MV 11 cm.; AV 8 cm. The myocardium of the right ventricle measured 0.4 cm. and that of the left measured 2.5 cm.

The epicardium was covered with very fine fibrinous adhesions. The myocardium was essentially normal. The coronary system presented moderate arteriosclerosis, the lumen in some areas being reduced to approximately 60 per cent of its normal diameter. The first portion of the aorta presented early calcific changes, with some encroachment on the cusps of the aortic valve. On the pulmonary cusps were verrucous, friable vegetations, each measuring 0.7 by 0.5 by 0.5 cm. They were tannish-red mottled with pink and crumbled upon gentle pressure. A slightly concave area on the terminal portion of the left semilunar pulmonary valve vegetation indicated that a part of this vegetation was missing. Fenestration of the cusps was present; the largest defect measured 0.3 by 0.2 cm.

The aorta showed marked atheromatous changes, with calcification and ulceration in the iliac region.

The right lung weighed 510 gm. and the left 400 gm. For the most part the lungs were semicrepitant and congestion was moderate. In the left lower lobe was an area of infarction 6 by 5 by 5 cm.; the artery leading to this area was completely occluded. In the right pulmonary artery was a large, recently formed thrombus which practically occluded the vessel. No infarcts were observed in the right lung.

The spleen weighed 210 gm. Its appearance was that of acute splenic tumor. Congestion was marked. The consistency was firm and the capsule did not wrinkle when the organ was placed on a flat surface. A slight perisplenitis was present, as evidenced by a thin layer of fibrinous material. The liver, which weighed 2,100 gm., presented no gross abnormalities other than chronic passive congestion. In the distal 2 feet of the colon were numerous hemorrhagic ulcers, each measuring approximately 1.5 by 1 cm. These ulcers, which were covered with bloody mucus, did not appear to penetrate the mucosa.

The brain, bladder, kidneys, genital organs, gall-

bladder, pancreas, adrenal glands, organs of the neck, spinal cord, bone marrow, and middle ears were grossly normal.

*Microscopic Examination:* Examination of the heart showed a fibrinous exudate with round cell infiltration over the surface of the pericardium. The myocardium was essentially normal. Attached to the cusp of the pulmonary valves were large vegetations composed of acute inflammatory cells, layers of fibrin, a small amount of connective tissue, and colonies of bacteria (Fig. 1). This cusp was not covered with endothelium (Fig. 2). It was itself involved in the acute inflammatory reaction and was infiltrated with polymorphonuclear leukocytes and macrophages. The valve did not seem to have been involved in a previous inflammatory process. The coronary artery showed atheromatous changes and the lumen was encroached upon and was approximately 80 per cent of the normal diameter.



Figure 1. Section of pulmonary valve (low power magnification); arrows point to colonies of bacteria.

Sections of the lung revealed an area of infarction with edema, congestion, acute inflammatory exudate, colonies of bacteria, and thickening of the alveolar walls; numerous pigment-laden macrophages were present. A section of a thrombosed artery showed layers of organizing fibrin and blood cells within the lumen (Fig. 3).



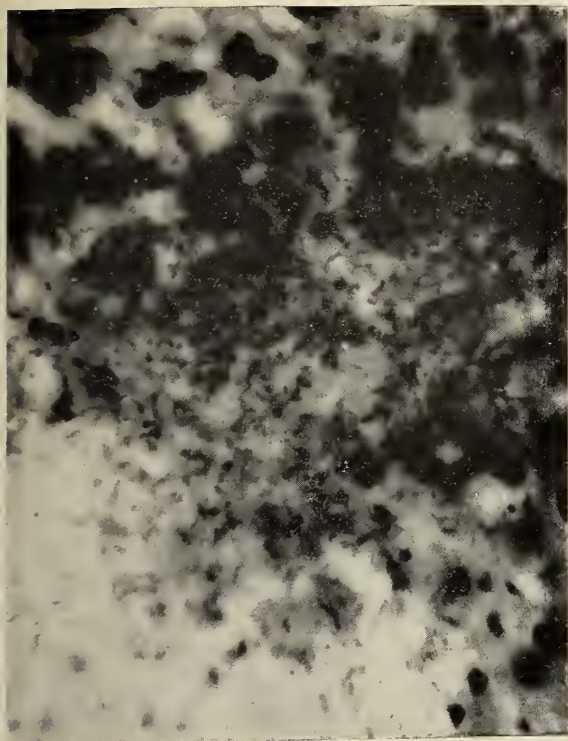


Figure 2. Section of heart valve (oil magnification) showing gram-negative rods in bacterial colonies.

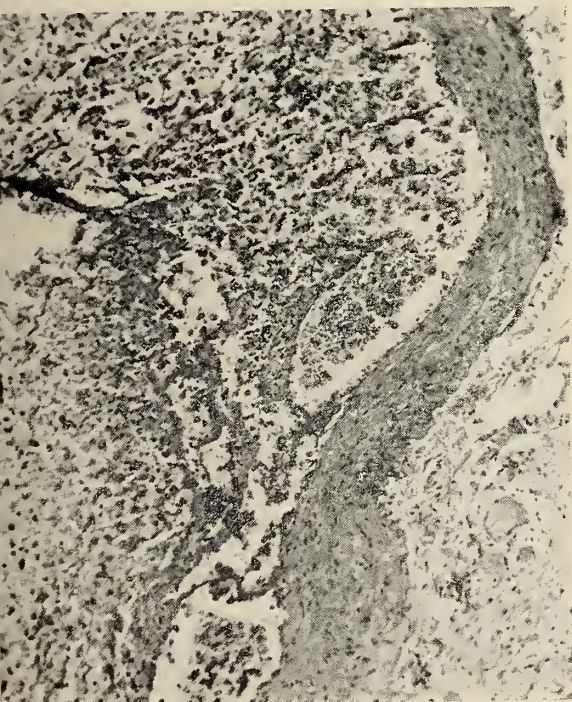


Figure 3. Section of lung (low power magnification) showing septic thrombus in a pulmonary artery.

Sections of the spleen showed marked congestion

with some decrease in malpighian corpuscles. The capsule was thickened and there was a fibrinous exudate on the surface.

The kidneys presented a picture of nephrosclerosis with a superimposed inflammatory process which appeared in isolated foci throughout the cortex. The process was characterized by marked congestion of the capillaries and small arterioles and by slight degeneration of the arterial walls. The glomerular pattern appeared undisturbed by this process but showed many of the hyalinized areas characteristically found in nephrosclerosis. The tubules in these focal areas showed cloudy swelling of the cells with early degeneration. (Figure 4.)



Figure 4. Section of kidney (low power magnification) showing focal nephritis.

The liver revealed chronic passive congestion. The pattern as a whole was undisturbed. A cavernous hemangioma was present.

**Final Diagnosis:** The essential parts of the final pathologic diagnosis were: acute suppurative bacterial endocarditis of *Salmonella* origin with vegetations of the pulmonary valve, fenestrations and cardiac hypertrophy; pericarditis; pulmonary thrombosis with septic infarction and congestion; toxic focal nephritis; hemangioma of the liver; chronic passive congestion of the liver; perisplenitis; ulceration of the colon.

#### COMMENT

The organism recovered by blood culture on two occasions was *Salmonella*, on the basis of morphologic characteristics and biologic reactions. The species of *Salmonella* at the present time number well over 150. *S. paratyphi* A, B and C, and *S. sendai* are



of chief importance in human infection. Specific types are identified by means of serologic tests which utilize their antigenic structure. This is impractical in the average laboratory. Typing is principally used in research as a quick and accurate method of identification of unknown cultures. Further identification of the organism in this case was not done.

This case differs in several respects from the usual case of acute bacterial endocarditis: (1) Acute bacterial endocarditis usually develops during the second and third decades and is most frequently associated with a history of valvulitis originating in childhood. In this case no antecedent history of cardiac disease could be obtained, and the disease first became manifest during the sixth decade. (2) Seventy-five per cent of all cases of acute bacterial endocarditis are superimposed upon previously deformed valves which are the result of rheumatic valvulitis. In this case there was no evidence of previous valvular lesions and no evidence of congenital valvular defects, which are another predisposing factor. (3) The valves involved in acute bacterial endocarditis are, in order of involvement, the mitral, the aortic, the tricuspid and the pulmonary. In this case the pulmonary valve, which is least often affected, was the site of the lesion.

The presence of petechiae, the thrombotic process in the lungs, the freedom from involvement of the myocardium, the toxic process in the kidneys, and the microscopic picture generally correspond with the usual observations in acute bacterial endocarditis.

The explanation of the clinical course in this case is difficult. When the patient was first seen, the emphasis was upon the pneumonitis and upon the cardiac condition, which was assumed to be congestive failure. On the first examination the liver was not palpable and the patient was not jaundiced. Twenty-four hours later the liver was enlarged and jaundice of the obstructive type was evident. Hepatomegaly and jaundice then regressed, only to become marked again at a later date, when, how-

ever, the jaundice was of the nonobstructive variety. Postmortem examination revealed no changes of consequence in the liver, yet ten days before death a physician who saw the patient for the first time minimized the cardiac aspect of the case and thought all the emphasis should be upon the hepatic factor. The cardiac involvement, as a matter of fact, was never clearcut after the first few days. The electrocardiograms were essentially negative and the patient at no time had symptoms clearly referable to the heart.

The state of shock which immediately preceded death is probably to be explained by the pulmonary infarction found at necropsy. The origin of the infarction and of the occlusion of the pulmonary vessels can reasonably be assumed to be the vegetations on the pulmonary valve.

To date, four proved cases of acute bacterial endocarditis have been reported in which *Salmonella* was the etiologic agent. The case of *Salmonella suispestifer* endocarditis reported in 1921 by Andrewes and Neave<sup>1</sup> in a four year old child ill for two weeks with *S. suispestifer* bacteriemia is probably authentic, but since recovery ensued it cannot be included in the list of proved cases.

The first two cases of the disease were recorded by Forster<sup>2</sup> in 1939. In both, the clinical picture was that of a severe infectious process with endocarditis; *S. suispestifer* was isolated from the blood streams in both. The second patient received sulfanilamide in adequate therapeutic dosage, without symptomatic or other improvement. Both patients had marked disturbances of cardiac rhythm and one had auricular fibrillation for the entire three-week period of hospitalization. At necropsy distinct evidence of antecedent cardiac injury was found in both cases.

The third recorded case of *S. suispestifer* endocarditis was reported by Read,<sup>3</sup> also in 1939. The case differs from Forster's cases in that the organism was of the European, not the American strain. As in Forster's cases, the clinical picture was that of a severe infection complicated by endocar-

ditis; there was no apparent antecedent disease. Sulfanilamide was not useful.

The fourth case was reported in 1942 by Goulder and his associates.<sup>4</sup> The patient, a 58 year old woman, had a previous history of rheumatic heart disease. Blood cultures were positive for the European type of *S. suipestifer*. Sulfapyridine was of doubtful value.

In their review of the four recorded cases of *Salmonella* endocarditis, including their own, Goulder and his associates noted the following points: (1) In three cases the lesion was superimposed on a damaged valve; rheumatic infection was antecedent in two cases and syphilis in one. (2) Embolic phenomena were noted in three cases. (3) The spleen was never palpable. (4) Fever was high and was associated with chills in all cases. (5) Leukocytosis, an unusual finding in uncomplicated *S. suipestifer* bacteriemia, occurred in all cases. (6) Changing murmurs were noted in three cases. (7) Chemotherapy was not effective in the three cases in which it was used.

The conclusion of Goulder and his associates, that endocarditis of *S. suipestifer* origin should be suspected in any case of bacteriemia caused by this organism whenever changing murmurs, embolic phenomena and leukocytosis are associated, would not have been particularly useful in the case reported herewith, since petechiae appeared only just before death, leukocytosis was not unusually high, and no significant murmurs or other marked cardiac abnormalities were present at any time. It should be noted that in this case neither penicillin therapy nor streptomycin therapy was useful, just as chemotherapy was not useful in the three reported cases in which it was used.

#### SUMMARY

The case of *Salmonella* bacteriemia associated with endocarditis reported in this communication is apparently the fifth case of acute bacterial endocarditis of this origin to be recorded. It differs from other recorded cases in that the cardiac aspects of the illness were throughout of an extremely insignificant character. Neither penicillin nor streptomycin altered the clinical course.

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## POLYNEURITIS WITH FACIAL DIPLEGIA SYNDROME DEVELOPING DURING ANTIRABIES VACCINATION

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AND

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Polyneuritis with facial diplegia is a well known clinical entity. It has been described in the literature under a variety of terms. This condition has been referred to as Guillain-Barré syndrome, acute polyneuritis, infectious polyneuritis, motoneuritis, acute polyneuritis with facial diplegia, and acute ascending paralysis. In addition, several other descriptive terms are used for the same condition.

The cases which come under the above terms are characterized clinically by an acute onset, mild or no febrile reaction, radicular neuritis, cranial nerve palsies, muscle tenderness and certain cerebrospinal fluid changes.<sup>1</sup> One of the commonest features of facial diplegia with polyneuritis is the albuminocytological dissociation. The occurrence of a normal cell count and an increase of the fluid proteins is a constant finding.<sup>2</sup> The course of the disease is usually benign and recovery requires from six months to two years. Death may occur from respiratory paralysis, intervening sepsis, or general debilitation.<sup>1</sup>

The etiology of Guillain-Barré syndrome, as we shall choose to call it in this report, is unknown. The syndrome is preceded by mild infections in the majority of cases. Kamman and Weisberg<sup>2</sup> and Morris<sup>3</sup> reported cases following serum sickness resulting from tetanus antitoxin. Chusid and



Marquardt<sup>4</sup> reported a case following exposure to mustard gas. Garvey, Jones and Warren<sup>5</sup> reported 6 cases which followed the use of sulfanilamide and general hyperthermia.

The syndrome must be distinguished from other infectious diseases of the central nervous system as well as other types of polyneuritis. The chief entities to be differentiated are acute anterior poliomyelitis and diphtheritic polyneuritis. Progressive involvement, sensory changes, symmetrical ascending paralysis, and albuminocytologic dissociation in the cerebrospinal fluid favor the diagnosis of Guillain-Barré syndrome. Diphtheritic polyneuritis may be ruled out by the presence of a positive Schick test, the failure to find the pathogenic bacteria in nasopharyngeal smears and culture, and the absence of clinical signs and symptoms of diphtheria.<sup>1</sup>

Paralytic reactions resulting from antirabic vaccine occur infrequently. In a statistical analysis and review of the reports from Pasteur Institutes throughout the world up to 1927, Remlinger<sup>6</sup> reports 329 cases of paralytic accidents occurring in 1,164,264 inoculations. This is an incidence of 0.028 per cent. In 1938 McKendrick<sup>7</sup> reported 139 cases of paralysis in 755,891 treatments from 1927 to 1938. This is an incidence of 0.017 per cent.

In general three types of paralytic reactions are reported following antirabies vaccination: (1) Ascending paralysis of Landry, (2) dorsolumbar myelitis, and (3) neuritis or isolated peripheral nerve paralysis. The ascending paralysis is 30-40 per cent fatal, and the myelitic type is about 5 per cent fatal. No fatalities are reported in the peripheral nerve type.

In addition to the above, Horack<sup>8</sup> reports several types of skin reaction following antirabies vaccination: (1) Generalized urticarial reaction; (2) delayed reactions of the tuberculin type occurring at the site of the injection and characterized by local redness, induration, tenderness, and itching; (3) reactions similar to the tuberculin type, but more severe and frequently associated with constitutional reactions. This

latter group should be closely observed for signs of development of paralysis.

The case herein presented deals with an individual who was receiving a second course of antirabic serum, and who developed a typical ascending neuritis. His neurological condition, at its onset, was accompanied by itching and a rash, along with generalized weakness of all extremities. This latter condition finally forced him to discontinue the antirabic treatment. The disease took on the typical attributes of an ascending paralysis with the spinal fluid picture seen in polyradicular neuritis, the relatively normal cell count and the markedly increased protein level. The patient made a complete recovery in twelve weeks.

#### CASE REPORT

Mr. Y., aged 38, was bitten by a rabid dog on October 17, 1947. On October 20, he began antirabic therapy daily until October 30. On October 27, he noticed itching and the sensation of "pins and needles" in all extremities. On October 28, his legs became weak and wobbly; he noted an inability to put his hands on objects reached for. His leg weakness became progressively worse, and he was not able to make more than one step without falling. At this time he began to have severe pains in the calves of his legs. It might be well to mention here that the patient had received a course of antirabies treatment one year previously that was uneventful.

Mr. Y. was admitted to the hospital on October 31, 1947. There were no noteworthy findings except in the neurological examination. The report was as follows: Positive past pointing. Bilateral absence of reflexes in the lower extremities. Positive bilateral Kernig sign. The only significant laboratory findings were in the spinal fluid.

Spinal fluid findings on admission: Sugar, 67.0 mgm.; Wassermann, negative; globulin, 2 plus; protein, 230.0 mgm.; chloride, 660 mgm.; colloidal gold curve, 0000224210; polys, 5.

On November 6, 1947, the spinal fluid was reported as: Sugar, 94.0 mgm.; Wassermann, negative; globulin, 3 plus; protein, 280.0 mgm.; colloidal gold curve, 000024543211; polys, 9.

Blood count: Red blood cells, 5.54 million; white blood cells, 10,350; hemoglobin, 128%; polys, 77; lymphocytes, 23.

#### PROGRESS NOTES

11/2/47 Patient developed left facial paralysis.

11/3/47 There was a weakness on the right side of the face. The back of the neck and the lumbar area were extremely painful and tender.

11/4/47 There was complete facial diplegia, and inability to move the lower extremities.

11/6/47 The patient exhibited an inability to move the left upper extremity. The deep reflexes were absent. There was no urinary or rectal incontinence.

11/11/47 His complaints included dyspnea, loss of appetite and pains in the thighs, which were relieved only by narcotics.

11/22/47 The patient became constipated. Fecal impaction removed. The maximum temperature was 100° F., pulse 100, respirations 28 per minute.

11/24/47 The patient was discharged with the diagnosis: Polyradiculoneuritis.

#### CONCLUSION

An early evaluation of the findings in this case might well have resulted in holding the antirabic serum responsible for the accompanying paralysis and other symptoms. However, the spinal fluid findings definitely fixed the diagnosis as Guillain-Barré syndrome.

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# NEW ORLEANS Medical and Surgical Journal

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## LIVER FUNCTION AND CHOLINE

The theory has been evolved in recent years that liver dysfunction, fatty infiltration and cirrhosis are part of a sequence resulting from failure of adequate nutrition. The concept of what is proper nutrition is a broad one which is conceived to include suitable proteins, carbohydrates and fats together with sufficient vitamins and "lipotropic" substances. The term lipotropic refers to those agents, principally choline, which appear to assist the liver in removing fat.

The etiology of cirrhosis is unknown but a number of contributing factors are thought to bear on the problem. Nutritional deficiencies conceivably lower the lo-

cal resistance to infectious disease and to toxic chemicals (such as mercury, arsenic, carbontetrachloride, chloroform, ether, gold and sulfonamides.) In whatever manner the process is initiated, atrophic cirrhosis is characterized by diffuse fatty infiltration with the overgrowth of fibrous tissue appearing later—presumably as a result of cell destruction. Alcohol in some individuals contributes to the picture by promoting a dietary deficiency and possibly is a factor in producing fatty liver. As has been well understood in the past, the sclerosing effect of fibrous tissue then prevents proper circulation within and through the liver, ultimately bringing the terminal picture of cirrhosis as it is currently recognized.

While disease of the liver is being slowly produced in this fashion, dysfunction is also partially manifest. It is clear that the liver has many functions and these concern the elaboration of products of fats, carbohydrates and proteins ingested. The liver is also concerned with formation and clotting of blood; the regulation of blood volume; the immunity and reticulo-endothelial defense system; the detoxification of certain harmful substances and many other processes of which we have even less knowledge.

There is an intimate connection between liver and kidney function. In Weil's disease there is a rapid appearance of azotemia. In experimental diets without choline there develops a picture comparable to uremia. Both organs are adversely affected in acute infectious diseases and in toxemias of pregnancy.

The manner in which choline works in the liver physiology is not clear. In the biochemistry of the recent past, choline was a toxic substance derived from protein. It is felt now that it is concerned in cellular metabolism stimulating increased utilization of fats by the hepatic cells. It is also thought to mobilize neutral fat by promoting the formation of choline-containing phospholipids. The use of choline in conjunction with the proper dietary regime has been shown in human livers to change

a fatty liver to one containing the normal amount within four weeks. It has also been reported to improve certain megaloblastic anemias resistant to liver therapy. The bearing that choline has on cholesterol metabolism and arteriosclerosis is obscure. It is reported that it has an effect in returning high plasma lipids to normal levels, but Best states the evidence that choline prevents cholesterol atherosclerosis is at present worthless.

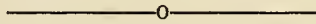
The early signs and symptoms of liver dysfunction are not definite. They consist of vague dyspepsia, ill defined abdominal discomfort leading to pain, nausea, particularly in the morning, flatulence and eructations. Following later are persistent asthenia, anorexia, loss of weight and anemia. When hepatic cirrhosis is moderately advanced, one finds vascular spiders, edema of the ankles, lowered serum proteins, ascites and hemorrhoids. Jaundice may be noted at any stage but is expected in some degree in the terminal phases.

The usefulness of the new concepts of liver disease is to delay and possibly arrest the development of the above picture. The therapy suggested in the light of these ob-

servations is dietetic and medicinal. In the stage of ascites and edema salt is restricted or eliminated. Fat in the diet is reduced to about one gram per kilo; proteins are increased to two grams per kilo and carbohydrate sufficient for caloric requirement is advised. Vitamin concentrates are necessary adjuncts to the diet. The lipotropic agents are given partly through the proteins of milk and cheese but primarily supplied by choline. The amount advised is two to three grams of a choline salt per day. Weekly injections of liver extract are desirable.

The results in favorable, that is early cases, are gratifying. Ascites and edema have been seen to disappear; appetite usually increases. There may be a gain in weight. There is usually an increased sense of comfort amounting to well being. In advanced cases of cirrhosis the results are less satisfactory but in many instances the change is sufficient to give comfort.

The knowledge that possibly improvement may follow treatment in early cirrhosis will increase the vigor of attack on the problem. Many individuals may be spared the terminal picture.



## ORGANIZATION SECTION.

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### STATE SOCIETY AWARDS

At the opening session of the 1949 Annual Meeting special recognition was given members of the State Society who have practiced medicine for fifty or more years and also to the General Practitioner of the Year for the State of Louisiana, selected in 1948. Following are talks presented by the President of the State Society, Dr. M. D. Hargrove, at the time of presentation of lapel pins to the Fifty-Year Doctors and a plaque to Dr. Charles M. Horton, recipient of the General Practitioner Award.

### FIFTY-YEAR DOCTORS

During the past year it was decided that the Louisiana State Medical Society should give special recognition to those doctors who have been in practice for fifty years, and are still members of the State Society. Accordingly, Dr. Talbot, our Secretary-Treasurer reviewed the roster of our members, finding among them 46, who have been practicing for fifty years and are still and general practitioners. Some names are members of the State Society.

The list contains the names of specialists



familiar in medical circles throughout the world and other names that are simply known in the community where the doctor has labored through the fifty years of practice. Regardless of the extent of their fame, the names are of men who through fifty years have given to their patients and to medicine the best there was in them.

Medicine and the doctor occupy a unique and honored place in most American households. That position of esteem and respect is due to the devotion to duty and sterling character of the family physician as portrayed by these 46 doctors. They, more than any others, have really put a heart in the practice of medicine. Truly they are deserving of this tribute to the American doctor.

Who shall measure devotion, or put a price on sacrifice?

Who shall assess the long war against the power of Death?

Or set a sum upon the gift of Life?

There is a service beyond the measure of a fee.

A cause above remuneration.

An ideal for which there is no price.

This is the service . . . the cause . . . the ideal . . . of the American doctor.

Who shall reckon it, and by what formulae?  
How much for the laughter of a little child  
rescued out of crisis?

What's the cost of discouragement?

Who can pay for a sleepless night?

Name the price of a cure?

There is no algebra for it, no scribble of figures, no proper value.

For this is a service as large as life, and as manifold.

It is a soldier crying in agony on a thousand battlefields.

It is the terrible word "Why?" under the surgeon's probe.

It is the end of pain.

It is Hope.

It is the lonely unending quest for knowledge.

It is the fight against ignorance, sloth,

superstition.

It is the dumb unspeakable joy in the eyes of a parent.

It is the rock of grief.

It is cold rain and pounding storm and bone-weariness, and the new born babe gasping its first breath in the grey dawn.

It is all this and the quiet glory of the job done,

Dedicated to service—in the name of Mercy  
And the common brotherhood of man.

We are proud of you my friends, and of your record of service. The Louisiana State Medical Society is distinctly honored by your fifty years of service. It has been a job well done and we can only hope that you will be with us and those you serve for many more years.

#### GENERAL PRACTITIONER

The Louisiana State Medical Society is tonight honoring and being honored by a distinguished member of our society.

You are aware of the policy of the AMA in selecting a general practitioner, who, because of the quality of his work, preferably in a rural community, is to be designated as the General Practitioner of the year. In 1948 each state society was requested to submit the name of one member whom they thought deserving of that honor. From those submitted the Board of Trustees of the AMA selected three, presenting their names and their qualifications to the House of Delegates, who by ballot, selected one of the three doctors for the award.

The award was first made in 1948 to Dr. Archie Sudan of Colorado. The Louisiana State Medical Society did not present a candidate that year. Last year we asked the various parish societies to suggest a member and give his qualifications. From those suggested the Executive Committee selected Dr. Charles M. Horton as the General Practitioner of the Year for the State of Louisiana.

His name was presented to the AMA and he was selected by the Board of Trustees as one of the three to be presented to the House of Delegates. Of the three, Dr.

Priestley of South Carolina, was selected as the General Practitioner of the Year, but being one of the three presented to the House of Delegates was a distinct honor to Dr. Horton and to Louisiana.

Many of you know Dr. Horton and the splendid job he has done in the practice of medicine. His life and work reads almost like a story book. For 37 years he has served the people of Franklin as their family physician. The quality and character of that work has won for him a place in their hearts which cannot be added to or detracted from. They know how well he deserves any and all honor that he has received.

Through the years of his practice Dr. Horton has been, and continues to be, one of the most active members of the Louisiana State Medical Society. He has held practically every office, served on various committees and worked unceasingly for the advancement of medicine.

In recognition of the selection of Dr. Horton as the General Practitioner of the Year for the State of Louisiana, and his selection by the Board of Trustees of the AMA as one of the three outstanding practitioners of the nation, the Louisiana State Medical Society presents Dr. Horton with this plaque.

Dr. Horton, presenting you with this plaque is an unusual privilege and honor coming to me as President of the Louisiana State Medical Society. We are being honored by you. The work you have done over the past 37 years speaks for itself and should serve as an example to the doctors of today.

On behalf of the State Medical Society I present you with this plaque, as an expression of our esteem and in recognition of the honor bestowed upon you, and by you upon the Louisiana State Medical Society.

## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

#### CANCER CONTROL ACTIVITIES

Tulane and LSU have in operation Cancer Detection Clinics. No additional clinics of this type will be planned but these two will be continued for teaching purposes.

The two universities have agreed to instruct eight physicians a week. Invitations to attend these Detection Clinic courses will be sent out from our State Medical Society office. Be on the alert for your invitation—we feel it will be well worth your while.

—a symposium on the diagnosis and treatment of cancer will be presented in each of the eight congressional districts.

Tulane and LSU will furnish the personnel for these courses. The expense will be defrayed by monies received from the Louisiana Division of the American Cancer Society, the State Department of Health, and the Louisiana State Medical Society.

Make plans now to attend these courses. Let's not be content to keep pace with the lay educational programs—let's stay ahead.

JOHN G. SNELLING, M. D., Chairman  
Executive Committee  
State Medical Society Cancer Committee

The Cancer Committee of the State Medical Society is planning a year-round program of postgraduate education. Twice during the year—Fall and Spring



### EAST AND WEST FELICIANA PARISH MEDICAL SOCIETY

The Bi-Parish Medical Society met with Dr. L. F. Magruder and staff in the East Louisiana State Hospital. This was a dinner-meeting after which a scientific program was presented.

Dr. Paul Jackson presented an excellent paper on Spontaneous Pneumo-Hemothorax. Dr. C. S. Toler led the discussion.

At this meeting Dr. L. F. Magruder was elected a member of the society. A vote of thanks was extended to Dr. Magruder and the staff and employees of the East Louisiana State Hospital for their excellent arrangements.

The society adjourned to meet again in the East Louisiana State Hospital on the first Wednesday in September, 1949, at 7:30 P. M.

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### AMERICAN HOSPITAL ASSOCIATION

A six-day course especially designed for hospitals in the planning stage has been added to the 1949 American Hospital Association Institute schedule.

The Institute on Hospital Establishment will be held on the Chicago campus of Northwestern University from August 8 through August 13.

American Hospital Association officials say the course was set up to meet a need that seems particularly acute in localities which have not heretofore operated a hospital.

The curriculum is being developed in cooperation with the Hospital Services Branch of the United States Public Health Service's Hospital Facilities Division.

Among topics to be taken up are establishing a budget, determining patient charges, personnel problems, public relations responsibilities, setting up a medical staff and nursing organization, service departments and business procedures.

Applications for attendance at the Institute should be addressed to Mr. Roy Hudenburg, American Hospital Association, 18 East Division Street, Chicago 10, Illinois. Tuition fee is \$35. Reservations can be made for dormitory accommodations on the University's campus.

Enrollment in the Institute on Hospital Establishment is limited to administrators of hospitals in the planning stage, members of governing boards of such institutions, and representatives of hospitals that are members of the American Hospital Association.

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### POST GRADUATE MEDICAL ASSEMBLY OF SOUTH TEXAS

The Fifteenth Annual Meeting of the Post Graduate Medical Assembly of South Texas will be

held at the new Shamrock Hotel in Houston, November 29-December 1, 1949. Sixteen out-of-state distinguished medical guest lecturers will appear on the program, representing the various specialties of medicine. Physicians planning to attend this meeting are urged to contact the Shamrock Hotel or the hotel of their choice as soon as possible for hotel accommodations. Further information may be obtained by writing the Executive Secretary at 229 Medical Arts Building, Houston, Texas.

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### NEWS ITEMS

Dr. Roy Carl Young of Covington attended the American Psychiatric Meeting in Montreal, Canada, May 22-27, 1949.

While there he also attended the Meeting of the National Association of Private Psychiatric Hospitals and was elected Treasurer of this organization for a period of one year, as well as to the Board of Trustees for a period of three years.

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Dr. T. A. Watters was a guest speaker at the annual session of the Mississippi State Medical Association in Biloxi on May 10. His subject was "Common Psychiatric Problems and Psychosomatic Disorders in General Practice."

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### RESEARCH FELLOWSHIPS—THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians announces that a limited number of Fellowships in Medicine will be available from July 1, 1950-June 30, 1951. These Fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in the early stages of their preparation for a teaching and investigative career in Internal Medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work.

The stipend will be from \$2,200 to \$3,200.

Application forms will be supplied on request to The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa., and must be submitted in duplicate not later than October 1, 1949. Announcement of awards will be made November, 1949.

## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

### WOMAN'S AUXILIARY

#### THE CONVENTION OF THE AMA AUXILIARY

Dear Auxiliary Members:

Instead of sending the usual message through the Journal at this time, I thought it might be interesting to tell of some of the happenings at Atlantic City.

As you strolled along the boardwalk and saw men of the medical profession and their wives greeting each other, you had a glowing feeling inside to see people so closely allied, all with the same objectives and fighting for the same ideals. There are few dissenters among the ranks!

The Auxiliary made a fine showing this year; 1500 women registered, the largest yet to attend a National Medical Convention. Did you know that the total membership is 49,000?

Forty-eight states were represented; nineteen state presidents came and the reports of forty-two states were read.

At the luncheon in honor of Mrs. Kice, National President, I sat next to a Miss Lam of Honolulu, whose mother is president of the Hawaiian Auxiliary. A doctor from the islands sent orchids to all the ladies present as a friendly gesture. Flowers were everywhere. At this luncheon, Mrs. Kice introduced her daughter and son-in-law, both doctors from Long Island.

At the luncheon in honor of the past presidents, we had the good fortune to hear both Whittaker and Baxter. The latter is Leone Baxter Whittaker, the wife of Clem Whittaker, who sent such informative literature from the Educational Campaign. Leone Baxter spoke for one hour on the evils of compulsory health insurance and the way to combat it. She held our attention throughout with her brilliance and personality.

Both Dr. Sensenich, President of the AMA, and Dr. Irons, President-elect, addressed us at the Wednesday luncheon. We appreciated the fact that such busy men would take time out to speak to us.

Many interesting things were brought out at the meetings. Oklahoma presented a document attested to by a Notary Public that in 1907 it had formed the first medical auxiliary. This year sees the first woman doctor to be president of a medical association. She is a charming woman! Maine is the baby auxiliary, not quite a year old. Oregon has an auxiliary member, the wife of every doctor who is a member of the Medical Association. Louisiana had two "firsts" among the States, the first permanent Rural Health Chairman and the first Auxiliary to the AAGP.

There were round-table discussions at which it was interesting and enlightening to get the viewpoint of the various auxiliaries. These discussions were on legislation, program and public relations. Because of the illustrated circulars sent out by

Mrs. Yaguda, Public Relations Chairman, her panel was the best attended. Note bene!

Now comes the best news of all! I am proud to report that Louisiana's own Mrs. Arthur Herrold of Shreveport was elected without opposition and with much enthusiasm to the office of National President-elect. None deserves it more than she, and can fill it more efficiently. Our best wishes to her.

I think it best that I stop now as anything else I may say would be an anti-climax.

Agnes Berdami Dunn, President  
Woman's Auxiliary to the Louisiana  
State Medical Society

P. S. Be sure to read the July "News and Views" for the suggested program of the State Auxiliary for 1949-1950.

### A. A. G. P. AUXILIARY ACTIVITIES

Surpassing all expectations in achievement and enthusiasm, the Woman's Auxiliary to the Louisiana Academy of General Practice held business and social sessions coincidentally with the men's groups on May 7 and 8 in New Orleans.

Highlighting the business session, Mrs. Joseph W. Kelso of Oklahoma City, Okla., president of the Woman's Auxiliary of the Southern Medical Association, was most helpful with suggestions concerning the various articles of the proposed constitution—advice garnered from years of experience in organizing women's groups. Most encouraging too were Mrs. Kelso's views on the advisability of the Louisiana group advancing plans for the organization of a Woman's Auxiliary to the American Academy of General Practice. Seconding the counsel of Dr. J. P. Sanders, first president of the Louisiana group (and one of the original thirteen who conceived and planned the American Academy of General Practice, Mrs. Kelso urged the need for such a unit and its unestimable possibilities for far-reaching influence.

Special guest of honor at the social functions was Mrs. Elmer Clinton Texter, wife of the president of the American Academy of General Practice. Other Auxiliary members of national note feted at the Patio Party honoring Mrs. Emma Wigginton, president of the first auxiliary to a state chapter of the American Academy of General Practice, were Mrs. Luther H. Kice, and Mrs. Arthur Herold, president and treasurer of the Woman's Auxiliary to the American Medical Association. Perfect in every detail of appointments and service, the Patio Party represented the painstaking planning of Mrs. George Feldner of New Orleans, and her convention committee of women from the first and second districts of the state. Dr. and Mrs. Feldner also entertained at a pre-convention cocktail party honoring their friends the Wiggintons, and a number



of early arrivals for the convention.

At the disposal of the A. A. G. P. Auxiliary members, a suite located in the Roosevelt Hotel proved a thoughtful arrangement for the convenience of both in and out-of-town members attending the sessions of the convention which extended from early morning until evening when a combined dinner and lecture meeting with the husbands climaxed the activities.

With the gracious charm with which she presided throughout the convention, Mrs. Wigginton installed the new officers of the Woman's Auxiliary to the Louisiana Academy of General Practice. They are: Mrs. Dorman B. Barber of Alexandria,

president; Mrs. George D. Feldner of New Orleans, president-elect; Mrs. John W. Atkinson of Gretna, vice-president; Mrs. N. M. Bryan, Jr., of Alexandria, secretary; Mrs. Frank H. Davis of Lafayette, recording secretary, and Mrs. Esmond A. Fatter of New Orleans, treasurer.

Appointment of councilors and permanent chairman will be announced shortly and members and prospective members will be contacted for local meetings preparatory to activities of great interest preceding the national convention scheduled at St. Louis in the Spring.

Mazie Adkins Guidry  
Chairman of Publicity

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## BOOK REVIEWS

*A Textbook of Clinical Neurology with an Introduction to the History of Neurology:* By Israel S. Wechsler, M. D. 6th ed., Philadelphia, W. B. Saunders Co., 1947, pp. 829, illus. Price, \$8.50.

The latest edition of this neurological standby is as usual a reference to have within arm's reach of those of us whose work makes it pertinent. It should certainly be a vade mecum for the medical student. Nevertheless, this reviewer considers it too sketchy in parts in spite of the desirable limitations on text-book size. Alzheimer's disease and its diagnostic differential Pick's disease are most certainly not rare entities of diagnostic consideration and yet the former is covered in 43 lines and the latter in 17! Electroencephalography is mentioned only in passing, particularly in the discussion of brain tumors and of the convulsive disorders where the technique is preeminently useful. No mention is made of the psychodynamic aspects of early multiple sclerosis although the either-or diagnosis of neurosis vs multiple sclerosis is common in some circles. Postencephalitic chorea is not discussed but simply cited to exist, whereas the almost preciously rare Dubini's chorea and the dubious chorea of Bergeron and Henoch are given each a paragraph. Some 57 pages which could have been devoted to more extended comment on neurology, or inclusion of omitted data of the type cited above, are devoted to an archaic Freudian presentation of the neuroses made notable by such statements as "Of all methods, psychoanalysis alone offers a consistent psychological approach . . .", and that dessicated old analytic chestnut—"many of Freud's opponents and lip-worshipping adherents adopt nearly all of his concepts, then berate him for refusing to abandon *that which their own resistance forbids them to accept.*" (Underlining mine—HTP). This section also contains a curious pre-Kinsey comment on the perversions.

It would seem worthy of question whether a large section on the neuroses has any place in a textbook of neurology. The author well states in his introduction, "No neurological status is complete without a mental examination," but references could well have been made to standard texts for the generally accepted classifications of mental disorder, a useful mental status examination outlined, and abnormal psychology theory avoided altogether. Certainly the medical student, the practitioner and the psychiatrist would benefit were more space taken up with the "why" of the sign, reflex, etc., instead of just the "where" and the "how." Despite Wartenberg, it is noted that Wechsler continues to speak of periosteal reflexes.

H. THARP POSEY, M. D.

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### PUBLICATIONS RECEIVED

The Blakiston Company, Philadelphia: How to Become a Doctor, by George R. Moon, A. B., M. A.

Grune & Stratton, Inc., New York: Cardiovascular Disease, by Louis H. Sigler, M. D., F. A. C. P.

Paul B. Hoeber, Inc., New York: Hematology, by Willis M. Fowler, M. D. (Revised Second Edition).

Oxford University Press, New York: Dutch Archives of Surgery.

W. B. Saunders, Philadelphia: Oral and Dental Diagnosis, Third Edition, by Kurk H. Thomas, D. M. D., F. D. S. R. C. S. Eng. Geriatric Medicine, Second Edition, edited by Edward J. Stieglitz, M. S., M. D., F. A. C. P. Psychosomatic Medicine, 2nd Edition, by Edward Weiss, M. D. and O. Spurgeon English, M. D. Medical Etymology, by O. H. Perry Pepper, M. D.

Charles C. Thomas, Springfield, Ill.: Obesity, by Edward H. Rynearson, M. D., F. A. C. P., and Clifford F. Gastineau, M. D.

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and

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### PUBLIC HEALTH AND INSURANCE ASPECTS OF AMEBIASIS

#### A NOTE ON CERTAIN ERRONEOUS CONCEPTS

JOSEPH S. D'ANTONI, M. D.

NEW ORLEANS

At the present time amebiasis occupies the anomalous position of being underestimated as to incidence, overestimated as to lethal possibilities, and largely mismanaged from the standpoint of public health. Physicians who treat diseases of the colon would be in general agreement with these statements. Those who do not might perhaps be inclined to dispute them.

#### INCIDENCE

The incidence of amebiasis in the United States is now usually set at about 10 per cent, which means that between 13 and 15 million persons suffer from the disease. In the colder northern portions of the country the incidence is probably somewhat lower. In warmer portions, such as Louisiana, it is higher. Faust's studies in New Orleans, which revealed an incidence in the neighborhood of 16 per cent, are probably typical for this part of the country.

The known or apparent incidence of amebiasis is directly related to four factors: the climate, the competency of the examiner, the type of stool examined, and the number of times the examination is re-

peated. Diagnosis is entirely a laboratory matter. Physical examination, except in amebic hepatitis and amebic abscess of the liver, is not helpful, and the history, while it arouses suspicion as to the existence of the condition, supplies no conclusive information.

The fact that the diagnosis of amebiasis is considerably easier to establish in a warm than a cold climate means that the known incidence of the disease is likely to be higher in a warm than a cold climate. For this situation there are at least two reasons. The first is that the number of parasites per unit of stool is usually materially larger in a warm than in a cold climate. This is clearly proved in a warm climate, such as New Orleans, when the seasons change. It is far more difficult here to establish a positive diagnosis by the identification of *Endamoeba histolytica* in winter than in summer because the parasites are less numerous in the winter.

The second reason why the diagnosis of amebiasis is often simpler in warm climates than in cold is the fact that the disease more often assumes a dysenteric form in such climates, and thus directs attention to itself. A patient with dysentery cannot ignore his symptoms; he must have medical attention. A patient with less severe manifestations, including diarrhea, may ignore his disease or may serve as his own physician. Dysentery is quite frequent in the tropics, much more frequent than it is in a subtropical climate such as that of New Orleans. In New Orleans, on the other hand, while amebic dysentery is not at all frequent, it is seen more often than in Salt

From the Department of Tropical Medicine and Public Health, Tulane University of Louisiana School of Medicine, and the Division of Tropical Medicine, Lakeshore Hospital, New Orleans.



Lake City, for instance, or Portland, or the New England States. For that matter, all symptoms are milder in winter and in cold climates than they are in summer and in warm climates.

The competency of the examiner ultimately determines the number of diagnoses made. This is not a task for a tyro. Craig has repeatedly stated that for a physician (or technician) to diagnose 90 per cent of the cases of amebiasis which come under his observation he must undergo a training period of at least two years, under qualified supervision, and must examine thirty to forty stools each day during this period.

The type of specimen examined has a great deal to do with the number of cases diagnosed. Sawitz, for instance, demonstrated that the efficiency of a single purgative specimen is equivalent to that of three normally passed stools. Examination of material aspirated from the colon at sigmoidoscopy is even more efficient, provided that the patient has been properly prepared. A single negative report cannot be accepted at its face value. Repeated examinations, at intervals of five to seven days, are necessary because the output of cysts is cyclic. The wet film preparation is to be preferred to the more elaborate hematoxylin eosin preparations for identification of trophozoites. The zinc sulfate centrifugal flotation technic is the method of choice for identification of cysts. One reason the diagnosis of amebiasis is missed so often is that, except in special laboratories, normally passed stools are more often examined than other specimens, and that a single negative examination is accepted as conclusive.

Figures for the Lakeshore Hospital in New Orleans for the twenty-three month period extending from July 17, 1946, to June 16, 1948, throw a good deal of light upon the statements which have just been made. During this period 9,675 patients were admitted to the hospital for all causes. Stool examinations were requested on 928 of these patients, from whom 1,143 specimens were examined, an average of 1.2 per patient. Presumably the referring physi-

cians had reason to suspect disease of the colon in most of these patients, though the reasons for the request for the examination were not usually known. An occasional specimen was secured by aspiration at proctoscopy and a number were purgative or enema specimens. Most often, however, normally passed stools were examined. *Endamoeba histolytica* was identified in 179 of the 928 patients, 19.3 per cent.

Over the same twenty-three month period I personally saw 1,479 adult patients in private practice, primarily for investigation of possible disease of the colon. On these patients 6,322 examinations were made, an average of 4.3 per patient. A few of the specimens were normally passed stools. The great majority were purgative or enema specimens or material secured by aspiration at sigmoidoscopy. *Endamoeba histolytica* was found in 971 of the 1,479 patients, 65.6 per cent.

Finally, over the same twenty-three month period 392 children under 12 years of age were seen by the writer in private practice. They had been referred chiefly for investigation of possible disease of the colon, or because of enlargement or tenderness of the liver, or for both reasons. In these cases 1,917 specimens were examined, an average of 4.9 per patient. A few of the specimens were normally passed stools. The greatest number were purgative or enema specimens or material secured by aspiration at sigmoidoscopy. *Endamoeba histolytica* was found in 268 of the 392 children, 68.3 per cent.

The comparative percentages of positive diagnoses in these three groups of patients are interesting and significant. In the first group of hospital patients, about whom very little is known, examinations were seldom repeated and the most efficient specimens were not usually presented for study. Only 19.3 per cent of the patients were found to harbor *E. histolytica*. In both the adult and children's groups of private patients the most efficient specimens were usually used for examination, and examinations were repeated many times. Of the adult private patients, 65.6 per cent were

found to harbor *E. histolytica*, which was identified in 29 per cent of the specimens examined. Of the children, 68.3 per cent were found to harbor *E. histolytica*, which was identified in 28 per cent of the stools examined.

It must be granted that disease of the colon was suspected among the private patients and that the suspicion was the reason for the examination in most cases. This may or may not have been true of the patients examined for other physicians in the laboratories of tropical medicine at the Lakeshore Hospital. The extremely high—and almost identical—proportion of positive results in the adult and children's groups of private cases is, however, in sharp contrast to the relatively low proportion of positive results in the general hospital group. The difference can be explained in part by the differences in the types of specimens examined, while the relatively small proportion of positive results in the total number of specimens examined in the general hospital group is clear proof of the importance of repetition of the studies. Special attention should also be called to the number of positive cases among children, in whom, until quite recently, the disease was believed to be very infrequent.

#### PUBLIC HEALTH ASPECTS OF AMEBIASIS

Amebiasis in Louisiana, and probably elsewhere, is a reportable disease which is not being reported. It is unlikely to be generally reported until public health authorities change their point of view concerning it. In Louisiana, as soon as the disease is reported by the physician in charge of the case, a social service worker is sent to the patient's home to interrogate him. Most of the inquiries are useless. Any information thus obtained is already in the files of the reporting physician. These inquiries have, however, the effect of embarrassing the patient, and of arousing resentment in him because he is put in the position of being a public health menace.

Actually, he is no such thing. He is under treatment and his disease is in process of being controlled. The public health menace is not the patient who is being treated. The

danger to the public in respect to amebiasis comes from two sources: (1) the patient whose disease has not been diagnosed and (2) the patient whose disease has been diagnosed but who refuses treatment or who will not return for adequate post-treatment follow-up. These are the patients who are dangerous to the community and they are the ones who should be the concern of the public health authorities.

A similar anomalous situation prevails in the schools. A child whose disease is reported is immediately shut out from school by the school authorities, and out of school he must remain until his disease is cured, which may be a matter of months. Because he is under treatment he is not a menace to his companions. Yet he is, in effect, penalized for being treated. In the same school, on the other hand, there are undoubtedly many children with undiagnosed amebiasis. These children are not being treated for their disease; they take no precautions concerning personal hygiene; and they are unquestionably spreading the infection. They furnish the real menace. Unless, therefore, some attempt is made by the school medical authorities to identify all the children in the school with the disease, to penalize the child who is under treatment is an unjust and thoroughly absurd situation.

#### THE LETHALITY OF AMEBIASIS

Precisely the same situation that prevails in the schools prevails when the patient with amebiasis attempts to secure insurance. If he tells the truth, he suffers. Some insurance companies raise the premium under these circumstances. Other companies require that the patient wait until cure is assured, usually for a period of two years, before insurance is granted at the standard rates.

Insurance companies naturally must protect themselves and their clients by careful inquiry into the previous history and current medical status of applicants for insurance. The possible longevity of an applicant who has had various diseases is of natural concern to them. They could not maintain their solvency if they did not take careful



account of such matters. Their fear is apparently that a patient who has amebiasis may develop hepatitis or liver abscess or both. It is true that both are serious conditions, especially the latter, but the situation should be surveyed in its true perspective before conclusions are drawn.

The facts of the matter at this time are about as follows: (1) The incidence of hepatitis and liver abscess has decreased notably since the introduction of effective amebicides. (2) A patient under treatment for amebiasis is highly unlikely to develop liver abscess; I have myself never seen this happen. Hepatitis, while a possibility, is also an unlikely development in a patient under treatment. (3) Should these complications develop, the fact that the patient is under treatment means that they will be diagnosed promptly and treated vigorously. (4) It is a curious but generally established fact that patients who develop amebic liver abscess, the most serious complication of amebiasis and the most frequent cause of death from it, are likely to be absolutely or relatively well until the abscess develops. They seldom give a history of diarrhea or dysentery. They almost never have been treated for amebiasis. The attending physician, therefore, unless he is aware of the frequency of amebiasis and realizes the insidious character of amebic liver abscess, often does not think of it as a possible cause of continued fever and general debilitation. (5) Unless the examination is made by a well qualified technician and in a special laboratory, *E. histolytica* is unlikely to be recovered in the stools. It is notoriously difficult to identify the parasite in the usual case of amebic liver abscess.

What these various considerations amount to, from the standpoint of the insurance companies, is that their interests are not served by penalizing the patient who is under treatment for amebiasis, or who has been under treatment for it and who honestly states the fact. These patients are not the ones who furnish the mortality in the disease. The mortality is concentrated in liver abscess. Numerous specialists in tropical medicine share my own experience

of never having seen a treated private patient die of amebiasis from any cause. If the insurance companies believe that amebiasis is a lethal disease, as their present policies suggest, then their point of view should be followed to its logical conclusion: All patients who apply for life insurance should be adequately checked (which means a great deal more than the examination of a single stool) for possible amebiasis. The number of positive results would probably be surprising.

The crux of the whole matter, in other words, is whether or not a patient with amebiasis has been treated. Even in a temperate climate an untreated infection will have some influence on longevity, just as any other chronic, untreated infection will have some influence on length of life. In the tropics the effect of an untreated amebic infection is even more serious: Most persons in the untreated group may be expected to develop amebic liver abscess or amebic dysentery. On the other hand, in the tropics, just as in temperate regions, a patient who has been treated for amebiasis, who has had a clinical cure, and whose stools are negative at the time of the insurance examination, is a good risk. He should not be refused insurance, nor should he be made to pay higher rates if insurance is granted him. The poor risk is the applicant with unrecognized or untreated disease, though at the present time he receives insurance without question and at the usual rates.

Very little can be found in the literature concerning the insurance aspects of amebiasis. For this reason Cawston's<sup>1</sup> article on the subject, although it appeared in an English medical journal and concerns the disease in South Africa, is of particular interest. In most respects, his point of view is the same as my own: The medical examination at the time of application for insurance is more important than the history of previous infection. If the candidate reveals no local tenderness over the liver, epigastrium, appendix, or descending colon, he is unlikely to be harboring an amebic infection, even if he has a history of previ-

ous infection. Negative laboratory reports, for various reasons, may be deceptive. Deaths caused by amebic infection are decidedly less common than those caused by bacillary dysentery. At least 90 per cent of all infections can be cured if the proper methods are employed. Although insurance of a known amebic cyst-carrier had best be postponed temporarily, experience shows that, since insidious liver abscess has become infrequent, he is more dangerous to the community than to himself. Deaths from amebic infection among insured persons are exceedingly rare. If a patient reports adequate treatment of a diagnosed infection, and if six months have elapsed since there has been any evidence of infection, the case may be regarded as on the same level as a successful cure of bilharzial infection and the candidate may be accepted "as first class without any loading" if no other abnormality has been revealed in the course of a thorough medical examination.

So far as I know, no special attempt has ever been made by workers in the field to show that amebiasis in any way affects longevity. It is well known that as an individual approaches middle life, his chances of contracting the infection become less, not because there are fewer opportunities for exposure to it but probably because an immunity to it develops as the result of previous infections which have undergone spontaneous cure. Whether or not this explanation is valid, the incidence of amebiasis begins to fall as middle life comes on, and it is considerably lower between 50 and 70 years of age than it is in young adult life.

A curious consideration in amebiasis is that the patient with amebiasis is in some respects benefited by having it. Because he suffers from easy fatigability he necessarily moderates his activities. He gets more sleep because he must have more. He drinks less alcohol and he dissipates less, because he cannot stand the pace. This period of lessened activity because of the disease has the contradictory effect of actually lengthening the life span. The statement is made with some hesitancy, because

on the surface it does not seem reasonable, but there is repeated evidence of what happens from the standpoint of activity when once a patient with amebiasis is cured of his disease. Once he is cured, or once his treatment is successfully under way, he becomes a normal, healthy individual, able to do all the things that he has not done over a period of years. It should be emphasized, moreover, that cure is possible with proper treatment, no matter how long the patient has had his infection.

It would be interesting to compare the longevity of citizens of such a city as New Orleans, where the incidence of amebiasis is approximately 16 per cent, and that of some of the cities in New England, where it is probably less than half as high. New Orleans has long hot summers. The damp climate causes a high incidence of sinus infections. All types of skin disease that thrive in warm climates are observed here. In the New England States, on the other hand, the upper respiratory infections which once were highly fatal in cold climates are now readily checked by antibiotic and chemotherapeutic methods, so that deaths from that source have been reduced to low figures in recent years. If amebiasis were really a factor in reducing longevity, it would seem that persons in New Orleans would live less long than those in the New England States. It would be interesting to determine whether that is true. My own experience with amebiasis makes it seem entirely unlikely.

#### SUMMARY AND CONCLUSIONS

Amebiasis is an infectious disease of widespread incidence. Diagnosis, which is entirely a laboratory matter, depends upon the competency of the examiner and the efficiency of the methods employed. Figures from hospital and private practice are cited to confirm these contentions.

The treated patient with amebiasis is not a public health menace. The treated patient with amebiasis is not a poor risk from the standpoint of insurance. Yet in both categories the treated patient is for all practical purposes penalized because his disease has been recognized and he has submitted to



treatment. The person with unrecognized and untreated disease continues to spread infection with impunity. He is definitely a poorer insurance risk than the treated subject because he may develop amebic dysentery or amebic liver abscess, both of which are serious complications. Yet he is granted insurance without question and at the usual rates if he is otherwise qualified.

Both public health authorities and insurance companies would do well to review their present policies in respect to patients with amebiasis and to alter them to conform with the realities of the situation. At the present time they do not. The diagnosis and treatment of this disease are all important from both the public health and insurance standpoints and due regard should be paid to both considerations in the evaluation of the patient with amebiasis, who at the present time is badly in need of a new medical deal.

#### REFERENCE

1. Cawston, F. Gordon: A note on amoebic infection from a life assurance point of view, *Practitioner*, 144:282, 1940.

## THE AMERICAN ACADEMY OF GENERAL PRACTICE

### WHY THE ACADEMY\*

J. P. SANDERS, M. D.†

SHREVEPORT

The development of the American Academy of General Practice was the outgrowth of a definite need. Specialization in all branches of medicine has definitely gone too far. Many men have always felt that they wanted to do general practice,—that they were more capable of doing a general type of practice than a specialty. In many parts of the country general practice is sorely needed, particularly in the rural districts. As a consequence, many general practice groups have developed all over the country. For example, Wayne County,

Michigan, has had a general practice group with a large membership for several years. About six local organizations of general practitioners grew up in California. A national organization developed largely located in the states of Wisconsin and Illinois, the American College of Physicians and Surgeons, composed of a very active group who attempted to do something for themselves. The general practice group of Greater St. Louis is another very interesting group that grew up early.

Finally the American Medical Association, realizing that the rural people's needs could be met best by the general practitioner, organized a section on general practice. The first session was held at the 1946 meeting in San Francisco. Dr. Paul A. Davis of Akron, Ohio, our national president, was its first chairman. The meetings of this section were one of the most enthusiastic groups in the whole American Medical Association meeting. Following the discussions during and after this meeting, a committee was appointed to draw up a constitution and by-laws and plans for a national organization, and to report back in Atlantic City in 1947. This was done. Dr. Stanley R. Truman of Oakland, California, was chairman of that committee, Dr. E. C. Texter of Detroit Michigan, Dr. Paul A. Davis of Akron, Ohio, and Dr. W. B. Harm of Detroit, Michigan, were other members of this committee. They studied constitutions and by-laws of every description over the country, about thirty in all, and finally developed the first constitution and by-laws, which were adopted by the Academy at our Organization Meeting in Atlantic City. The secretary of every medical society in the United States was notified by letter that the meeting was to be held on June 10, at the Claridge Hotel, during the American Medical Association Centennial Session. This meeting was attended by one hundred or more general practitioners and the constitution and by-laws were adopted and the present officers were elected: Dr. Paul A. Davis, president; Dr. E. C. Texter, vice-president; Dr. Stanley R. Truman,

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secretary; and Dr. U. R. Bryner of Salt Lake City, Utah, treasurer. Nine directors were elected from over the United States. The writer was one of those so honored.

#### OBJECTS AND PURPOSE OF THE AMERICAN ACADEMY OF GENERAL PRACTICE

As set forth in the constitution and by-laws, the purposes and objects of this organization are as follows: (1) To establish an organization of general practitioners of medicine and surgery, to promote and maintain high standards for the general practice of medicine and surgery; (2) to encourage and assist young men and women in preparing, qualifying, and establishing themselves in general practice; (3) to preserve the right of the general practitioner to engage in medical and surgical procedures for which he is qualified by training and experience; (4) to assist in providing post-graduate study courses for general practitioners, and to encourage and assist practicing physicians and surgeons in participating in such training; (5) to promote the science and art of medicine and surgery and the betterment of the public health; and to preserve the right of free choice of physician to the patient.

There probably never was a medical organization that met with as much favor as the American Academy of General Practice. The medical press has lauded us to the skies. The American Medical Association has been co-operative. The Board of Trustees, in February, appointed three of their outstanding members to co-operate with the Academy in working out future plans. The lay press has been unusually generous in its publicity. National journals have carried articles and the Medical Times has devoted a section to general practice. Other magazines have been very liberal in their discussion of our aims and purposes. Daily newspapers have helped us in a great many ways. In our own state of Louisiana the press has been very generous in publicizing our organization meetings, and gave full coverage to the Annual Scientific Meeting, which was held April 3-4, 1948, in Alexandria, Louisiana.

THE ACADEMY IS NOT AN ANTAGONISTIC GROUP

The Academy is in no way trying to take

the place of any of the specialists. We realize that men who have given years of their lives to one specialty know more about that than the general practitioner. But we do feel that there should be somebody who knows something about all organs of the body and who can treat them all at the same time. Many patients feel that they want a family doctor. They do not want to lose the patient-doctor relationship. The family doctor has definitely not passed out of the picture.

The American Medical Association realized this when they created the General Practitioner Award last year. The gold medal was first awarded to Dr. Archer C. Sudan of Colorado, formerly of Kremmling and at present of Denver. Dr. Sudan was picked from among those doctors all over the United States who most typified the general practitioner or family doctor. I had occasion last summer to pass through Kremmling and talk to some of the residents there about Dr. Sudan. It has been my good fortune to meet Dr. Sudan on several occasions and to have him at our State Scientific Meeting in Alexandria on April 3-4. A man of Dr. Sudan's calibre might not know as much about one individual subject as a specialist, but must know a great deal about all parts of the body. Many of his patients live fifty or seventy-five miles away. He has had to travel in the heat and cold. Many times he has been snowbound and has had to walk through the snow for miles. He has had to treat the patient with what equipment and what drugs he had available.

#### THE THREAT OF SOCIALIZED MEDICINE

The threat of socialized medicine has also shown us that we need more general practitioners. During the taking of testimony in Congress against the Murray-Wagner-Dingle Bill, the general practitioner was often called upon. The general practitioner gets closer to the patient than the specialist in most cases. Most patients do not care patients do not care whether the specialist is socialized or not, but certainly do not want their family doctor to be socialized. In Washington last year we three general practitioners had occasion to entertain our



own Congressmen from Louisiana. We had a get-together meeting and thrashed out many of the things that they had on their minds regarding the doctors in general. Each one had some grievance against some specialist, but none wanted the status of his family physician molested. In the regimen for socialized medicine, the general practitioner would have little or no place. His part would be only that of a clearing house for the specialists. He would be permitted to treat emergency cases only, make some sort of diagnosis and then send the patient on to the specialist required.

#### WHAT CAN THE GENERAL PRACTITIONER DO?

A conscientious general practitioner will do those things for which he is specifically trained. We must realize that he has had at least three years in college, four years in medical school, one year in a rotating internship. This certainly must equip him for doing a lot of work. It has been estimated that 85 per cent of all human medical needs can be taken care of by a good, well-trained general practitioner. If he has a special desire to follow some line, he will study and take more courses in that type of work. He will become a little more proficient in that one particular line. This is the way specialists develop. In times gone by there was no such thing as a specialist, but because of special interest the man developed a little more experience in ear, nose and throat work, and, consequently, became a specialist in that. We are living in an age of specialization and I certainly hope that we will never see that pass. I would hate to live in a town or community in which there were no specialists. I would hate to think that I could not call on some man who did not know more about one part of the body than I do. But, I still think that good general practitioners can do as well an all-around job on the ordinary diseases, as a group of specialists, and certainly, the cost to the patient will be less.

#### IMPROVED STANDARDS OF THE GENERAL PRACTITIONER

To belong to our organization, we have several qualifications, which are as follows: (1) You must be a member in good standing with your county and state medical so-

cieties, and the A. M. A. We do not think that we ought to go into a community and determine who is a good doctor and who is not; the A. M. A. has done that. (2) We require that he be a graduate of a Class A medical school and have at least one year of rotating internship and three years in general practice. We think that after he has met these requirements he should be eligible for our organization. But there is an additional requirement which, we think, makes ours greater, probably, than most of the specialty groups; that is the 150 hours of post-graduate work required every three years to get into our organization and the 150 hours to stay in it. This is mandatory and our rolls will be reviewed every three years. Most of the specialty groups feel that they need some such provision. A good man may get into their organization and never do anything thereafter. But he can stay in the organization for the rest of his life. In our organization this man's attainments will be reviewed every three years and if he has not kept up, he will be suspended and finally retired from the organization entirely.

#### WHAT THE ACADEMY HAS DONE DURING ITS FIRST SIXTEEN MONTHS OF EXISTENCE

To date thirty-two states have organized, including Louisiana. We hope by the end of the year that we will have all forty-eight states, the District of Columbia, and Hawaii organized as state groups. Later on, we hope to get in a portion or all of Canada. There are approximately seven thousand members on our rolls at the present time and more coming in every day. We hope to have ten thousand by the time of the annual meeting in March. There are many district and county organizations. For example, in Louisiana all of our eight congressional districts are organized on a district basis and are holding regular scientific meetings about every three or four months. Several states have already held a state scientific meeting and the national organization has held one business meeting of the Congress of Delegates in Chicago, June 20-21 this year. Large plans are being made for the first scientific assembly to be held in Cincinnati on March 6-9, 1949.

The program committee has been active in trying to get the best talent possible all over the United States and make this the best program of the year. We are to have a total of nineteen scientific papers and two additional addresses. There will be only one general section, in which the speaker addresses everybody. There will be scientific and technical exhibits and we hope to have the outstanding meeting of the year. At the meeting in Cincinnati on September 15, the Executive Committee, the Scientific Committee, the Technical Exhibit Committee and the Local Arrangements Committee conjointly completed all the details for the meeting. The headquarters will be in the Netherland-Plaza Hotel and I hope that each and every one of you will plan to attend that meeting with your wife. It is planned to have an Auxiliary Organization meeting at that time.

THE FUTURE OF THE AMERICAN ACADEMY OF  
GENERAL PRACTICE

We think that the future of the American Academy of General Practice is in good hands. I have never belonged to an organization whose officers and directors were as earnest, sincere, and hardworking as the present ones are. They are men of broad experience, of unlimited energy and are outstanding in their own communities. They are working tirelessly getting a good job done well. They have the confidence of the men around about them, whether they are specialists or general practitioners. They have the confidence of the American Medical Association in general. People now know that we are not going off half-cocked, that we have a job to do and that we are trying to do it well. We are not fighting anybody. We are trying to raise the standards of the general practitioner. We are trying to make him a better doctor. In that way we hope to maintain the prestige that he justly deserves.

PROBLEMS THE ACADEMY HOPES TO HELP SOLVE

Incidentally, we are going to help answer some problems that are outstanding in medicine at the present time. One of them is, *Rural Health*. Obviously, the rural community has to depend on the general practitioner. Rural people do not want poor,

second-rate medical care. They want the best that can be given. We think that this can best be given by a good, well-trained general practitioner. Another problem to be solved is, *Socialized Medicine*. We think that a good, well-trained general practitioner can give good medical care at less cost than several specialists treating the same disease. This leaves the specialists for consultation and for the complicated diseases for which he is trained. *The Program of Our Medical Schools*: We think that medical schools maintained by tax money should be more interested in training good, well-rounded general practitioners. This should be started back even in the undergraduate and continued through the interne training. We believe that since 85 per cent of human ills can be treated by good, well-trained general practitioners, a majority of medical students should be trained along general practice lines. We think that the different departments in medical schools should look forward to training men for general practice rather than a specialty. *Hospital Training*: We think that the first year of internship should be a rotating internship; that the young doctors should be given advantage of all the groups. The training that year should follow, more or less, the plan outlined for medical schools. The plan should still lead toward a career as a general practitioner. Then, if a man wants to take a residency, and many of them will continue to do so, we think every well regulated hospital should have a section on general practice for residency training. According to our plans at the present time, this should be a two year residency. It should contain about equal amounts of medicine, obstetrics and gynecology, surgery, and pediatrics, with small amounts of the other specialties thrown in, as best fits with their program. We think that a young doctor, after he has had these three years of training should be capable of going out into a rural or suburban community and giving the people good medical care. If the community has provided hospital beds, laboratory, and x-ray facilities, along with



the other things that are necessary for good medical care, then we feel sure that such a young man will be satisfied and continue in the general practice of medicine. *Specialists*: Others that want to go into the specialties, obviously, can start out in their residencies at the end of the one year internship. However, there is a growing belief among many general practitioners and specialists that general practice itself, for a three to five year period, should be a prerequisite to specialty training. This will be discussed pro and con in the future and should be thoroughly considered. A man who has done general practice for several years and then goes into a specialty, knows more surely what he wants than if he has done no practice at all. The doctor who has done general practice for a few years should definitely be a better specialist.

#### WHAT THE ACADEMY MEANS TO THE GENERAL PRACTITIONER

1. It should maintain the physician-patient relationship better than any other group in the world.

2. It should maintain the prestige of the general practitioner in the community in which he lives.

3. It should give the general practitioner a standing among his fellow doctors, similar to that of the specialist.

4. It should increase his financial income. There is no reason why the general practitioner should not make as much money as the specialist, if he is as well-trained and does as good work.

5. It should help him maintain his hospital standing. We do not want a general practitioner to do work on a patient, surgical or otherwise, unless he is equipped. But, if a man is well-trained in surgery of the abdomen and still wants to do general practice, we believe that his right to do abdominal surgery should be maintained by our group.

6. We should stimulate more men to go into the general practice field. Many young men have gone into a specialty simply because it has been the popular thing to do. This should stop.

In conclusion, I wish to state that we are fighting nobody. We intend to work with

the American Medical Association, the state medical societies, and the county medical societies to maintain high scholastic standing for our doctors. While we do not want all general practitioners in our group, we want those that are in our group to be the best ones in the community. We expect them to keep up their post graduate work and their standing among their fellow men. If we do this, then we have accomplished a great deal. And last, but not least, we hope to keep the family doctor forever in American Medicine.

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### MENOPAUSAL BLEEDING

CURTIS TYRONE, M. D.

NEW ORLEANS

In order to appreciate the significance of menopausal bleeding, it would seem necessary first to consider the meaning of the menopause. The menopause may be defined as that period in the life of a woman when menstruation normally progressively declines and eventually ceases. Although cessation of menstruation is the most prominent manifestation, usually associated with this are different degrees of vasomotor, neurogenic, and emotional symptoms. Slight variations in the menstrual flow during the menopause are to be expected but abnormal uterine bleeding at this time demands a careful history, prompt and thorough pelvic examination, and diagnostic curettage when necessary in order to determine the cause before treatment is instituted.

Abnormal uterine bleeding may be caused by almost any pathologic condition which can affect the pelvic viscera. Most often it is a manifestation of such benign conditions as fibroids and fibrosis of the uterus, strictures of the cervix, chronic cervicitis with erosion or eversion, and polyps. However, despite the fact that it is less common,

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the condition most frequently associated with abnormal uterine bleeding by both the layman and the physician is carcinoma of the uterus and cervix.

It is true that considerable advances have been made during the last few years in the methods of diagnosis of normal and pathologic changes in the pelvic organs of women in the menopause, but too much emphasis has been placed on these newer diagnostic procedures. To be specific, the vaginal smear has been considered by some as a definite test for the diagnosis of malignancy of the pelvic organs and many women consult us insisting on being given a test for cancer. Although the vaginal smear is a valuable auxiliary diagnostic measure, it should never be substituted for the time-honored and proved methods, such as careful history, examination with the vaginal speculum, cervical biopsy, and diagnostic curettage.

As soon as the cause has been determined, treatment should be instituted promptly. There is no one accepted method for the treatment of menopausal bleeding which should be employed to the exclusion of all others. The treatment selected should depend on the individual case.

The administration of hormones for the control of abnormal bleeding at, near, or after the menopause, is not only unnecessary but dangerous, because this delays the institution of proper treatment of premalignant and malignant conditions and creates a false sense of security. The value of hormones is even questionable in the functional type of bleeding associated with the menopause.

Since the introduction of radium in 1917,<sup>1</sup> and later roentgentherapy for the control of menopausal bleeding, too much emphasis has been placed on the use of these agents for this purpose. The mere control of menopausal bleeding is no insurance that the patient will have no recurrences and that a premalignant lesion will not progress to a malignancy later. This is an important consideration now when the life expectancy of women is almost 70 years, as

these women still have twenty-five or thirty more postmenopausal years of life.

It is true that radiation is effective in controlling bleeding at any age but there are many contraindications to its use. It should never be administered to emotionally unstable women. Its use is contraindicated in women with extensive obstetrical injuries, lacerated and diseased cervixes, prolapse of the uterus, large myomas, or adnexal disease. It should likewise never be employed in women who have previously been subjected to extensive pelvic operations complaining of pelvic pain in addition to uterine bleeding.

There is no doubt that radiation is easy to administer, has a low morbidity and mortality, and eliminates the bleeding following treatment but it does not assure the patient that she will have no difficulties in the future. The danger of the development of a malignant condition in the uterus or cervix at a later date is ever present. The incidence of malignancy after radium therapy has been estimated as 0.5 per cent<sup>2</sup> but it is not known whether these patients were followed only a few years or for the rest of their lives. Cancer does develop in patients over 70 years of age and at this stage it is always difficult to treat.

The performance of many minor operative gynecologic procedures such as conization or surgical amputation of the cervix, suspension of the uterus and resection of the ovaries with or without salpingectomy often fails to eliminate the abnormal bleeding and in many instances does not correct pathologic conditions which eventually will require a more radical procedure. Therefore, in the management of patients with menopausal bleeding, I prefer total vaginal or abdominal hysterectomy with preservation of normal adnexa in patients who have not reached the age of a normal menopause. Before this procedure is performed on any patient, exactly what is going to be done should be explained to the patient in her own vocabulary. Many emotional conditions developing after this procedure are due to failure of the surgeon to explain to the patient exactly what he intended doing



and the significance of the procedure. The patient should be assured that removal of the uterus will not produce nervousness, hot flushes, irritability, insomnia, insanity, loss of sexual powers, or obesity. She should be informed that hysterectomy will eliminate not only the vaginal bleeding but also the future possibility of pelvic operations for pelvic malignancies. Careful attention to these details will insure a relieved and satisfied patient in the future and will abolish the possibility of the development of malignancy at a later date. The mortality rate of hysterectomy is no greater than the future danger of the development of genital malignancy if more conservative measures are used.

This does not mean that conservative measures have no place in the control of menopausal bleeding. There are many patients with normal pelvic organs in whom irregular menstrual flow can be controlled by various conservative measures such as office cauterization of the cervix, simple curettage, weight reduction, correction of dietary deficiencies, relief of anemia by transfusions, iron therapy, and, most important of all, control of emotional states by reassurance. The family physician can best accomplish this latter point by convincing the patient that there is no danger of the development of cancer and that the menopause is a natural phase of life which all women undergo.

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#### DISCUSSION

Dr. R. E. C. Miller (Alexandria): Dr. Tyrone has ably described the usual things that cause bleeding during the menopause. The thing that puzzles me, and I am sure puzzles you, is what to do for the patient, when all the laboratory procedures have come back negative, all physical examinations negative, and you feel you don't know where the bleeding is coming from. Even your consultant says, "Well, I don't know where she's bleeding from." Now, I think that Dr. Tyrone has got the answer to it—A hysterectomy—a hysterectomy at this age—it is remarkable to me how many patients at this time don't know anything about their own anatomy, certainly very

little about the physiology of the female organs. I know that many of you have had patients—intelligent patients—come in and say something is wrong "down there" and not know what is normal bleeding and what is abnormal bleeding. So many patients even today think that the menopause is a time for plenty of bleeding instead of spotting of bleeding. I have never found any adequate description of the function of the uterus other than the fact that it is a child-bearing organ, and so many patients at the menopause stage, when they stop bleeding, either by a natural means or surgical means, think they are then out of this world as far as they are concerned as an individual. Magazine articles are coming out all the time telling about the symptoms of the menopause. I believe that hysterectomy, either total hysterectomy or vaginal hysterectomy, properly done, will never have any effect as far as sexual relationships are concerned, and I still think in those cases where the diagnosis is not obvious that the solution is a hysterectomy.

Dr. Tyrone (In conclusion): I'd like to thank Dr. Miller for his very excellent discussion and remind you of the statement that he made that he has found no definite importance of the uterus other than for childbirth. I could go a little further than that and say that the uterus has three functions: (1) to menstruate; (2) to bear children; and (3) to develop malignancy later on.

Therefore, after the childbearing age has passed and menstrual irregularities, such as hypermenorrhea and polymenorrhea and metrorrhagia, develop, I would advise total hysterectomy with preservation of normal adnexa up to the age of 45 years. This especially holds true of the patient with such menstrual irregularities, who in addition has obstetrical injuries with varying degrees of prolapse and an infected and lacerated cervix and/or diseases of the fundus of the uterus, such as adenomyosis, fibroids, or fibrosis.

### ORAL ESTRUSOL THERAPY IN THE MENOPAUSE

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AND

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During the past few years there has been an increasing appreciation of the fact that a large psychic component is

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\*Estrusol used in this study was furnished by courtesy of Carroll Dunham Smith Pharmacal Co., New Brunswick, N. J.

associated with the menopausal era and its complaints. Despite the number of subjective symptoms which are attributed to this psychic component, the striking symptoms of vasomotor instability, flashes, flushing, and sweating are attributable to estrogenic deficiency and are best controlled by estrogenic therapy. We have reduced the amount of estrogenic therapy utilized in the menopausal era in the past few years, and with the advent of effective oral estrogens have shifted emphasis from the use of hypodermically administered drugs to orally administered drugs. Because of the proved efficacy and relative cheapness of the synthetic estrogens we have also shifted to a considerable extent from the biologic to the synthetic estrogens. However, some 10 to 15 per cent of patients are intolerant to the synthetic estrogens. We have stressed the importance of reassurance, psychic therapy, and mild sedation, rather than the wholesale application of estrogenic therapy to every menopausal patient. Despite this fact there remain a large number of patients whose vasomotor symptoms are sufficiently severe to give them considerable disturbance, and it is chiefly in this group of patients that we have utilized estrogenic therapy.

For the present study we selected menopausal patients, who in addition to the various ailments of the menopausal era, have as an outstanding component of their syndrome the complaint of severe flashes and flushes. These patients were divided into three groups. One group was given a placebo, the tablet appearing exactly like the active estrogenic tablet. A second group was given sedation alone, and a third group was given estrusol orally.

The estrogenic activity of estrusol tablets is due principally to estradiol. The tablets that we used were assayed by the method of Kahn and Doisy and were found to contain approximately 10,000 International Units per tablet. These were administered in dosage of 1 tablet per day for fourteen days. The patients when first seen were interviewed and a complete history and physical examination obtained,

together with such pertinent laboratory data considered necessary. Every attempt was made to rule out systemic diseases which may mimic symptoms of the menopause. The patients were then assigned to one of the three therapy groups in rotation.

Fifty patients were in the group receiving placebos, and at the end of a two week period 5 stated that they had complete or partial relief. The remainder complained of symptoms as severe or of greater severity than upon first being seen. In the second group, who received only simple sedation with phenobarbital grs. 1/4, three times a day, there were also 50 patients. At the end of a two week period 26 of these patients stated that they had marked relief of the symptoms that would be attributed to nervousness such as, insomnia, and irritability, but had obtained no relief from their vascular symptoms. Nine patients had partial relief from their symptoms other than the vascular ones, and the remainder had no improvement.

Of the 50 patients who were placed on estrusol therapy, 31 patients stated at the conclusion of the two week period, that they had complete relief from their flashing and flushing. Seven patients had partial relief, and the remainder had no relief. However, of the 31 patients who had relief of their vascular symptoms, 16 of them still complained of some degree of nervousness, irritability, and insomnia. These patients were placed on a combination of phenobarbital and estrusol, at a later date, and had complete relief of all symptoms.

During this initial trial period no patient gave evidence of any toxicity from estrusol therapy.

The groups were then continued on the same therapy for an additional two weeks, the results being approximately similar. In the first group 6 patients stated that they had some relief. In the second group 22 stated that they had considerable improvement, 12 had some improvement and the remainder had none. In the estrusol group, 30 had complete relief, 9 partial relief, the remainder no noticeable improvement.

After maintaining these patients on this



routine for a month the patients in the placebo group were transferred to one of the other groups and then continued in the survey as such. Of the other two groups, the ones who previously had sedation alone were given sedation (phenobarbital) and estrusol. The ones who had estrusol alone were given estrusol and phenobarbital. The combination of a simple sedative and the estrusol gave marked improvement in the majority of cases. Of the 100 cases so studied 73 had marked improvement, 64 of these stating that they had complete relief of their vascular symptoms. Thirteen patients had partial improvement of all symptoms, 9 of these having partial relief of their vascular symptoms. The remainder stated that they had no particular improvement.

From the observations of this preliminary study on an orally effective estrogen, estrusol (principally estradiol), we feel that this drug has no toxic effect and has a marked beneficial effect in the management of menopausal symptoms attributable to estrogenic deficiency. The study is being continued and a more complete survey will be published at a later date.

#### VAGINAL BLEEDING FROM THE USE OF POTASSIUM PERMANGANATE

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Recently two cases of severe vaginal bleeding due to the use of potassium permanganate were admitted to the Charity Hospital of New Orleans. Both were of sufficient severity to be admitted to the hospital for treatment because of the amount of blood lost. One of these cases will be described.

##### CASE REPORT

C. S. a colored female 19 years of age, was admitted to the Charity Hospital on July 7, 1945 with a chief complaint of vaginal bleeding. The patient stated that she began to bleed suddenly and profusely following a douche of potassium permanganate solution taken that morning. She stated

that she habitually used "potash tablets" in preparing a douching solution, but denied that she had ever placed any undissolved tablets in the vagina. She estimated that she had lost a quart of blood before coming to the hospital.

The last regular menstrual period started on July 1, 1945 and the patient denied pregnancy or any attempt at abortion. On pelvic bimanual examination the uterus was found to be retrocessed, not enlarged, slightly boggy in consistency; the cervix was slightly softened but closed. There were no abnormal masses, tenderness, or fixation in the adnexal regions, and the uterus was freely movable. Speculum examination of the vagina and cervix revealed no active bleeding at the time of admission; however, on the right vaginal wall about midway between the introitus and the cervix an adherent black eschar was noted. In the center of this was a small adherent blood clot. There was also a small bleeding area just to the right of the cervix.

She was discharged on July 8, 1945 after receiving 500 cc. of blood. Final diagnosis: Chemical burn of the vagina and possible early pregnancy.

A search of Charity Hospital records for the past several years failed to reveal any similar cases. None were found in the emergency room records of this institution for the past three years.

A review of the literature produced only two references to vaginal burns from the use of potassium permanganate in this country. Both reports came from the Boston City Hospital; the first in 1941 by Shull,<sup>1</sup> and the second in early 1945 by McDonough.<sup>2</sup> Shull reported 17 cases occurring between the years of 1936 and 1940 and McDonough found that this series had increased to a total of 65 cases by the end of 1944 at this institution. They observed that in all their cases potassium permanganate tablets had been inserted into the vagina to produce "menstruation", although 5 of the 17 cases reported by Shull denied use of the tablets to produce abortion. However 15 of Shull's cases had amenorrhea of one day or longer; one of this group had inserted the tablet on the day of expected menses; one had a positive Friedman's test. The duration of the amenorrhea, in the cases reported by McDonough, was as long as six months.

These authors state that the cases presented all gave a uniform clinical picture, easily confused with threatened or incom-

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plete abortion. Three characteristics common to all were (1) painless, profuse vaginal bleeding; (2) a tightly closed cervical os; (3) a circumscribed, charred vaginal lesion which could be visualized easily by the use of a vaginal speculum. In 4 cases of McDonough's, in which speculum examination did not seem to be immediately indicated, a diagnosis of incomplete abortion was made because of the apparently open cervical os and because of a misleading history of having passed fetal tissue. The correct diagnosis was made only after the cervix was exposed under general anesthesia. McDonough further observed that the onset of bleeding in these cases usually occurred within two hours after the insertion of the tablet and persisted after removal of vaginal clots. Although the irregularity caused by the chemical burn can be usually felt on the cervix or vaginal mucosa, the routine use of a vaginal speculum in all cases of threatened or incomplete abortion is emphatically recommended by both authors.

As to treatment, 6 of Shull's cases required bed rest only; 9 required vaginal packing and 2 required suture of the lesion to stop active bleeding. In McDonough's series, 10 cases required from one to three mattress sutures to control bleeding from the eroded area, thirty-four were treated by firm vaginal packing for forty-eight hours and 12 cases were given treatment for shock including several transfusions.

Only 6 were successful in producing abortion, as evidenced by the recovery of fetal tissue, and only 1 had a vaginal vault adhesion secondary to the burn. No generalized toxic symptoms as a result of absorption of potassium permanganate were observed.

In view of the rarity of this lesion in the United States, it is interesting to note that it has been recognized for a number of years by Italian, Spanish, and French writers as a cause of vaginal bleeding. A total of ten references was found in the foreign literature, the majority coming from Italy. The earliest reference was by Valenzi,<sup>3</sup> and most recent by Taddei,<sup>4</sup> in 1934 and 1940,

respectively. Folsome,<sup>5</sup> reviewed the paper of Taddei and pointed out that he described 2 cases in detail in which potassium permanganate had been used as an abortifacient and gave a complete review of the literature. He also summarized the pathology, symptomatology, diagnosis, clinical course, complications, and treatment. G. de Maria,<sup>6</sup> reported a case of "cicatrix of the uterine neck due to chemical caustics ( $\text{KMnO}_4$ ) as a cause of dystocia". Two of the foreign authors refer to cases of grave vaginal hemorrhage caused by potassium permanganate used as a lavage, apparently in concentrated form, to produce abortion.<sup>7, 8</sup> Carteaud and Barowski,<sup>9</sup> report a case of "pseudo-chancere of the uterine cervix" caused by the insertion of this drug in tablet form.

In view of the extremely caustic local action of potassium permanganate in concentrated form on the mucous membrane of the vagina, it is noteworthy that this drug swallowed accidentally or for suicidal purposes, although common in occurrence, is rather innocuous. This is probably due to early and rapid vomiting and to dilution of the drug in the stomach contents, thereby preventing erosion and subsequent hemorrhage.<sup>10</sup>

#### COMMENT

Potassium permanganate should be considered as a cause of unusual vaginal hemorrhage. The use of the drug as an abortifacient is definitely popular at present in the area of Boston, as evidenced by the reports of Shull and McDonough, and seems to be increasing. Although no cases have been reported in other areas of the United States, the possibility of its use for this purpose should be kept in mind, and the fact that it can cause vaginal bleeding, closely simulating threatened or incomplete abortion, should be remembered. Women should be cautioned to use the drug only in solution and in the proper dilution if used at all. Some women douche by inserting the end of the rubber tubing into the vagina without the tip and it is possible for a partially dissolved tablet to be deposited in the vagina.



## CONCLUSIONS

1. A case of vaginal bleeding from the use of potassium permanganate is reported and the literature on this subject reviewed.

2. The need for recognition of this drug as a cause of vaginal bleeding, particularly during early pregnancy, is emphasized.

3. A speculum examination of the vagina and cervix should be made routinely in all cases of threatened or incomplete abortion.

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## ADVANCED ABDOMINAL PREGNANCY

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In discussing the paper of Wilson<sup>4</sup> on advanced ectopic pregnancy, at the recent meeting of The American Gynecological Society, Campbell proposed the following question: "If one were to recognize a late abdominal pregnancy, unaccompanied by symptoms, in the event of the child being alive but of questionable viability, should such a case be treated as an emergency or would one be justified in postponing operation in the hope that by waiting one might obtain a viable baby?"

This question is a most interesting one, and all of us may at one time in our careers be faced with such a problem. I cannot definitely answer such a question, but if we

recall some of the hazards facing both mother and infant, we should have a better understanding of the problem.

Advanced abdominal pregnancy is interesting from many viewpoints—etiology, diagnosis, treatment, and fetal survival. In a paper of this type which is limited as to time, it is not feasible to cover all the salient features of this condition. Consequently, I have chosen to discuss advanced pregnancy located extrauterinely as to diagnosis and as to the hazards faced by the mother and fetus.

## DIAGNOSIS

For all practical purposes late abdominal pregnancy is always secondary to a tubal pregnancy although a few cases of apparent primary peritoneal implantations have been reported. Consequently, in the majority of cases a history of an episode simulating tubal rupture or abortion is obtained in the early months of pregnancy. The symptoms often are so slight as to be overlooked by the patient, and the findings so minimal as not to warrant active treatment.

Following this episode of tubal abortion or tubal rupture the fetus may survive and continue to grow, giving rise to the later signs and symptoms of an advanced extrauterine pregnancy.

The most prominent symptoms noted are persistent pelvic or abdominal pain, more severe than the usual complaints noted in the normal pregnant woman. There are also gastrointestinal disturbances, such as nausea and vomiting, or severe indigestion in the latter months of gestation. In the multiparous patient definite statements as to the location and character of fetal movements are suggestive. Fetal activity may be felt either very high or very low, and it may be markedly decreased or increased over that of former pregnancies.

A patient who gives a history of a possible early tubal abortion or rupture and who complains of the above symptoms in the latter months must be given a careful physical examination in order to rule out an extrauterine pregnancy.

The most characteristic physical findings are as follows: Upon abdominal examination the fetus is usually located high and in

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a transverse or oblique position. Fetal parts are easily palpable, and fetal heart tones are loud in character. The patient is usually sensitive to palpation. Definite failure to feel the round ligaments, of course, is pathognomonic of an extruterine gestation. Likewise failure to feel uterine contractions is suggestive.

Pelvic examination is important and must be done carefully in order to elicit supporting signs of an abdominal pregnancy. The cervix is usually not as soft as that of an intrauterine gestation and it is characteristically uneffaced and undilated. If it does admit a finger, no products of conception are felt in the uterine cavity. An abnormal position of the cervix is frequently noted. The uterus is not enlarged to the size compatible with the period of pregnancy and an extrauterine mass is palpable.

X-ray certainly is a useful procedure in diagnosing advanced extrauterine pregnancy.

#### HAZARDS TO THE MOTHER

There are two main hazards to the mother with an advanced ectopic gestation, namely, hemorrhage and peritonitis. In Cornell and Lash's<sup>2</sup> series of 236 cases three-fourths of the deaths were due to these two conditions. Generalized peritonitis accounted for the one death in Beacham's<sup>1</sup> 20 cases.

At any time placental detachment may occur and lead to massive intraperitoneal hemorrhage with a fatal termination unless immediate measures are employed to control the bleeding. On the other hand, fetal death with subsequent infection of the fetal sac may occur. The products of conception, lying in the abdominal cavity, are in intimate contact with the intestines and are easily infected from this source. Suppuration occurs, the sac ruptures, and generalized peritonitis results.

These two conditions, hemorrhage and peritonitis, are serious ones of course. Fortunately today we have at our disposal such great helps as blood, chemotherapeutics, and antibiotics, which have enabled us to reduce the number of deaths from these two hazards.

One cannot discuss the problem of late

abdominal pregnancy without mentioning the management of the placenta. At the time of laparotomy it is essential to realize that this organ can be left without jeopardizing the life of the mother. Consequently, if the placenta is attached intimately to the intestines or other abdominal viscera, leave it alone. Fatal hemorrhage results from injudicious attempts to remove the placenta. If there is any doubt as to the possibility of removing this organ, then the best policy is hands off.

#### HAZARDS TO THE FETUS

Not only does the mother face certain dangers, but also the fetus is exposed to hazards from extrauterine pregnancies which have advanced to viability. We<sup>3</sup> have studied the fate of living babies from ectopic gestation. From this study we have concluded that only about one-fourth of all extrauterine pregnancies diagnosed after the fifth month will result in viable living babies. Approximately one third of these infants will have minor and major deformities, some of which are incompatible with life. These deformities are for the most part plastic in type and result from pressure phenomena. Some of these deformities may be corrected by orthopedic measures. About 50 per cent of these viable babies will survive eight days or more; while the others will have died in the neonatal period.

#### SUMMARY

The signs, symptoms, and physical findings of late abdominal pregnancy are discussed. Major maternal hazards in these cases are fatal hemorrhage and generalized peritonitis. About one fourth of all extrauterine pregnancies diagnosed after the fifth month will result in viable babies. One third of these babies will have plastic deformities. Fifty per cent will survive eight days or more.

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# VALUE OF PROCTOSCOPIC EXAMINATION IN GENERAL PRACTICE\*

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Probably no patients are more reluctant to seek medical assistance than the ones with anorectal complaints. These patients will usually take the advice of a friend or the neighborhood pharmacist for relief of rectal symptoms rather than consult a physician because of embarrassment, and frequently this results in delaying the diagnosis of a serious condition beyond the period when treatment can be effective. For this reason, the public should be made conscious of the dangers of procrastination in seeking medical aid for anorectal diseases merely because of a feeling of false modesty. However, the responsibility of early diagnosis of anorectal conditions is not entirely that of the patient. The general practitioner can detect many conditions in the stage when curable treatment can be instituted if he will take the time to obtain a careful history and make examination of the anus, rectum, and sigmoid a routine part of the general examination. The general practitioner may be inclined to omit examination of the rectum if the patient fails to mention symptoms referable to this organ. It should be borne in mind that many patients are extremely reluctant to volunteer information concerning bowel habits and anorectal sensations unless specifically questioned. Furthermore, the general practitioner should not let his personal distaste for performing a rectal examination interfere with its routine performance. Only in this way can many serious rectal conditions be detected before they become incurable.

This discussion will be confined to a few of the more common anorectal complaints encountered in general practice for which a proctoscopic examination is indicated.

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Read at meeting of the Orleans Parish Medical Society, December 13, 1948, in New Orleans.

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Among these are bleeding, rectal pain, change in bowel habits, masses in the perianal region, protrusions, and pruritus ani.

## BLEEDING

Bleeding is one of the most important signs of rectal disease and should always be regarded with grave concern, for although the cause may be trivial and the bleeding transient, hemorrhage in this region may be a threat to life itself. If all cases of proctorrhagia were considered by the patient as well as by the physician to be due to cancer until proved otherwise, there would be a considerable decrease in the present delay in early and correct diagnosis of rectal malignancies.

The duration of bleeding, whether intermittent or constant, and the color, whether bright red, dark red, or tarry black, are important clues to diagnosis. The relation of bleeding to bowel movement should also be determined, that is, whether it oozes, drops, streaks the outside of the stool, or is mixed with the stool. The dripping of blood after a bowel movement or the unexpected soiling by blood is usually due to a lesion which is below the grasp of the external sphincteric muscle. Associated anal discomfort suggests a lesion distal to the anal cutaneous line or the dentate line, since this represents the upper limit of sensory innervation. Bright red blood usually comes from the rectum and anal canal, and dark red blood signifies that it has remained within the intestine for some time or that it arose in the gastrointestinal tract. In general, it may be assumed that bright red blood comes from a lesion distal to the sigmoid, whereas dark blood suggests a lesion proximal to the rectosigmoid. However, there are exceptions to this rule. For example, profuse hemorrhage may result from a duodenal ulcer with rapid passage of this blood through the intestinal tract and its appearance through the anus while it is still bright red. On the other hand, the blood from an internal hemorrhoid may be passed as a dark clot from the rectal ampulla many hours after bleeding occurred.

Every patient with rectal or anal bleeding should have the advantage of digital,

anoscopic, and proctoscopic examinations. If hemorrhoids are noted, they should never be accepted as the cause of bleeding until polyps, or ulcerative or inflammatory diseases of the bowel have been eliminated by adequate examination. Polyps are frequently the cause of bleeding from the rectum and a high percentage of these lesions are precancerous. For this reason, it is imperative that they be discovered and eliminated before they become cancerous. Next to the skin, the rectum and colon are the most frequent sites of carcinoma in the body. From 70 to 75 per cent of cases of carcinoma of the entire large bowel are within the reach of the sigmoidoscope. Too often the physician has sent away the patient who complained of bleeding from the rectum with a box of suppositories or a prescription for them and the assurance that these will help him. In my opinion, suppositories are not only useless but dangerous. They do not cure any lesions. Occasionally they may relieve pain but this benefit is counteracted by the danger of lulling the patient into a sense of false security. The medication in suppositories does not reach the lesion. If the patient is ambulatory, the melted cocoa butter, which is the chief constituent of any suppository, seeps through the anal canal to soil the patient's clothes. If the patient is in bed, the melted suppository follows the law of gravity and runs into the hollow of the sacrum away from the anal canal where are located most of the lesions for which suppositories are given. The medication is therefore rarely ever in contact with the lesion for a sufficient length of time for even palliative value.

If digital, anoscopic, and sigmoidoscopic examinations do not reveal the cause of the bleeding, a roentgenogram of the colon with barium enema should be obtained. Roentgenography with the instillation of a contrast medium is essential for the location of the majority of polyps of the colon. If this does not reveal the cause of bleeding, the patient should be repeatedly examined until the source has been located.

#### RECTAL PAIN

Many patients will complain of "rectal"

pain which actually is pain of anal origin. This is probably the most frequent proctologic symptom which causes the patient to seek medical aid. Numerous lesions, such as uncomplicated hemorrhoids, and benign and malignant growths, do not give rise to pain but may cause pressure. Thrombosed or strangulated hemorrhoids, or a foreign body in a crypt may be the cause of pain, but more frequently some infection in or near the anal canal, such as fissure in ano, cryptitis, abscess formation or fistula in ano, is the usual cause. The character of the pain at the time of onset with relation to bowel movements often gives diagnostic clues. Sharp, acute, cutting, burning, tearing or stinging pain, spasmodic in character, coming on with or following passage of the stool, always points to a lesion in the anal canal, such as, a fissure in ano or chronic ulcer. The pain of cryptitis is usually sharp and lancinating. Pain of a throbbing or constant character usually indicates an ischiorectal, perirectal, or perianal abscess. This pain is ordinarily not affected by evacuation. Extension of infection from the anal crypt may produce a chronic fissure in ano, peri-anal abscess, or a fistula in ano. Finally, recognition of any one of these lesions may be possible by digital and anoscopic examination.

#### CHANGE IN BOWEL HABITS

The number and character of stools passed during the twenty-four hour period represent the individual daily bowel habit. It is generally considered normal for a person to have one evacuation of the bowels daily. However, it is not unusual to find perfectly well people who have a movement every other day or even every third day. Likewise, persons can be considered normal who have two or three stools daily and also there are those who never have a formed stool. A change in the bowel habit or character of the stool is considered by some as presumptive evidence of malignancy of the colon until carcinoma has been ruled out by adequate examination. A definite alteration in bowel habits should always make one suspicious of disease in the colon or rectum.

At the first interview the patient should



be questioned as to the presence of constipation or diarrhea, whether there is pain or blood, whether the stool is hard or soft, its shape, such as pencil stool or ribbon stool, whether the stool is covered with mucus, blood, or pus, and whether the action is complete and satisfying. It is important to know the patient's age, occupational habits, and environment, and whether he uses cathartics or enemas. Stools mixed with blood and purulent debris are seen in cases of malignancy, nonspecific ulcerative colitis, and other types of ulcerative colitis and proctitis.

#### PROTRUSIONS

Although the most common type of rectal protrusion is some variety of hemorrhoids, prolapse of the rectal mucosa occurs much oftener than is usually recognized. There are two types: mucosal prolapse, which is the common type, and complete prolapse or protrusion of all layers of the rectum. Protrusions of the anal papillae and carcinoma must also be considered in the differential diagnosis. The patient should be asked if the protrusion first appeared following a bowel movement, if straining was necessary to produce it, if it appeared spontaneously, and if it could be replaced. The number of protrusions is also significant. If bleeding occurs at the time the protrusion appears, and if the protrusion remains outside the anal sphincter, a polypoid rectal growth should be suspected. Polyps may be attached by a long pedicle or they may be sessile and protrude with a fold of mucous membrane. In children, the history of protruding, bleeding hemorrhoids should lead one to suspect the presence of one or more polyps.

#### ANAL AND PERI-ANAL MASSES

Masses in the perianal region may be single or multiple, smooth or nodular, rough, hard, or fluctuating, and are usually caused by inflammatory processes. An elevation at one or the other side of the anus accompanied by throbbing pain, elevation of temperature, and tenderness is usually a manifestation of an ischiorectal or peri-anal abscess. It should not be difficult to diagnose these masses because of the accessibility of this part to inspection

and palpation. A hard mass appearing suddenly at the anal verge often accompanied by intense throbbing pain is usually due to an acute thrombotic external hemorrhoid. Single or multiple, firm, small, nodular elevations in the perianal space are not infrequently condylomas acuminatum or granulomas. Smooth, rounded, nontender elevations are usually lipomas or sebaceous cysts. Elevation of the peri-anal region from which a purulent discharge exudes is usually the external opening of a fistula in ano. These may be single or multiple. Skin tags are soft; they are of frequent occurrence and usually of long duration. A sentinel "pile" is an acute inflammatory elevation of skin and granulation tissue at the distal end of a fissure in ano. It must be remembered that epitheliomas and, in rare instances, tuberculosis and syphilis, may occur in this region.

#### PRURITUS ANI

Itching in the peri-anal region is probably the most annoying symptom excluding pain. The degree of itching varies greatly. A simple, transitory type is usually due to unhygienic habits and must not be confused with real pruritus ani. The aggravating and demoralizing effect of anal pruritus is characteristic of the pruritic syndrome. Itching may be of such intensity as to interfere seriously with the patient's work and sleep. Itching as the predominant symptom, in my experience, has usually resulted from some local lesion of the anorectal region. It should be kept in mind that constitutional diseases, such as allergy, diabetes, dysentery, and acidosis, may predispose to itching in any part of the body. Of utmost importance is determination of the etiology of the itching, if possible.

All local pathologic conditions, such as internal and external hemorrhoids, hypertrophied prolapsing anal papillae, fissure in ano or fistula, should be eliminated before any attack on the pruritus itself is made. The cause of itching may be a fungous infection of the peri-anal skin or an id reaction to a distal focus or fungous infection.

After every effort has been made to determine the cause of itching and to elimi-

nate the local pathologic condition, there will remain some cases in which a diagnosis cannot be made. Most of these, I believe, are of neurogenic origin.

## SUMMARY

In summary, it might be said that if a patient gives any evidence of symptoms referable to the anus, rectum, or colon, a complete history and physical examination including examination of the anus, rectum, and colon should be done to establish a correct diagnosis as a requisite to proper treatment. It has been estimated that proctosigmoidoscopic examination will indicate or assist in indicating the diagnosis in one of every seven patients.

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 MECONIUM ILEUS

WALLACE SAKO, M. D.

NEW ORLEANS

The relationship of meconium ileus to pancreatic achylia was first indicated by Landsteiner<sup>1</sup> in 1905. Since then various investigators<sup>2, 8</sup> have shown their etiological relationship. Sidney Farber<sup>4, 8</sup> reported that in 18 cases coming to autopsy an obstructive lesion could be demonstrated in the pancreas in every instance. The purpose of this paper is to present 6 cases of true meconium ileus seen by the author in the past twelve years and to discuss briefly the principal features of the disease and its treatment.

Meconium ileus should be differentiated from inspissated meconium which arises from partial or complete intestinal obstruction such as volvulus or obstruction at the ileocecal valve. In the latter condition, the character of the meconium is normal, and therefore, when the obstruction is relieved, the meconium is readily evacuated. On the other hand, the basis of true meconium ileus is pancreatic achylia. The absence of pancreatic secretions results in the production of abnormal meconium largely in the ileum and jejunum. The meconium is thick, sticky,

and mucilaginous, so that normal evacuation from the gastrointestinal tract is impossible. Thus obstruction results. The ileum and jejunum are dilated tremendously, to such an extent that they are far larger than the caliber of the large intestines. Sometimes dilatation of the ileum and jejunum causes necrosis of the intestinal wall resulting in rupture and release of its contents into the free peritoneal cavity. This happened in Case 6.

The pathological lesion in the pancreas responsible for meconium ileus has been described by Kornblith and Otani,<sup>2</sup> Hurwitt and Arnheim,<sup>3</sup> and by Farber.<sup>4</sup> The obstruction in the pancreas may be one of two kinds or both:

1. Stenosis or atresia of the pancreatic ducts.
2. Intrinsic obstruction with inspissation of the abnormal secretions in the acini, dilatation of the acini, atrophy, dilatation of the smaller pancreatic ducts, and finally fibrosis of the pancreas.

At times the pathology in the pancreas may be localized; in other instances it may be a generalized process involving all the secretin producing structures of the body, particularly the tracheal and bronchial secretory apparatus leading to chronic pneumonia, or the secretory structures of the liver with resultant cirrhosis.

## DISCUSSION

If pancreatic achylia occurs at the time of birth, meconium ileus invariably results. If it occurs after the neonatal period but under one year of age, the clinical picture produced is that of chronic fibrosis of the pancreas with malnutrition, chronic pulmonary pathology, or cirrhosis of the liver. If it occurs after the first year, the clinical picture produced closely resembles that of idiopathic celiac disease. The pathogenesis of the three clinical conditions is therefore dependent on the time at which the pancreatic achylia occurs.

Meconium ileus is invariably fatal. In cases 5 and 6 the obstruction was completely relieved by irrigation with normal saline and 10 per cent pancreatic extract but the patients succumbed in sixty-one days and

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TABLE 1.

## SUMMARY OF 6 CASES OF MECONIUM ILEUS.

No.	Birth Weight	Sex	Age at Diagnosis	Tryptic Activity	Surgical Treatment	Medical Treatment	Age at Death	Autopsy Findings
1.	6 lb. 4 oz.	Male	4 days	Not done	None	None	6 days	Atresia of pancreatic ducts.
2.	8 lb. 1 oz.	Male	6 days	Not done	None	None	10 days	Stenosis & atresia of pancreatic ducts.
3.	7 lb. 12 oz.	Female	2 days	Not done	None	None	7 days	Stenosis & atresia of pancreatic ducts.
4.	7 lb. 6 oz.	Male	Birth	Not done	Laparotomy, ileostomy and washing with saline	None	4 days	Stenosis & atresia of pancreatic ducts.
5.	6 lb. 6 oz.	Male	Birth	Absent	Laparotomy, ileostomy & irrigation with 10% pancreatic extract	Pancreatin Casein hydrolysate	61 days	Stenosis & atresia. Intrinsic obstruction.
6.	7 lb. 4 oz.	Male	Birth	Absent	Laparotomy, mobilization of rupture in ileum to abd. wall	Pancreatin Casein hydrolysate vitamins	52 days	Stenosis & atresia. Rupture in terminal ileum.

fifty-two days, respectively, from malnutrition and bronchopneumonia. Farber<sup>5, 8</sup> has shown that the abnormal meconium can be liquefied by the addition of pancreatin suspended in normal saline in a concentration of 1 to 10 per cent. In a concentration of 1 per cent the meconium is liquefied in from two to four hours, but when the concentration is 5 or 10 per cent, it is liquefied in one to two hours. On this basis it has been recommended that the meconium ileus can best be relieved by an ileostomy and injection of pancreatic extract in a concentration 1 to 10 per cent. By this procedure the obstruction can be relieved, but since the fundamental difficulty is pancreatic achylia, the patient ultimately succumbs.

In 2 of our cases (cases 5 and 6) analysis of the duodenum contents failed to reveal any evidence of tryptic activity. This was also reported by Farber.

After the intestinal obstruction is relieved surgically, there still remains the problem of supplying the absent pancreatic secretion and maintaining the nutrition of the patient. The management then should proceed along two lines:

1. Dietary regime, giving the infant foods which can be absorbed and readily utilized. When dogs are subjected to experimental pancreatic achylia by tying off the ducts, their ability to handle the primary foods will be poorest with protein; next, the fats, and last with the carbohydrates. Shohl has shown that patients with pancreatic fibrosis will have large bulky abnormal stools, which may assume as much as 25 per cent of the total body weight. These bulky fecal materials contain from four to five times the normal excretions of nitrogen and from three to five times the amount of fat which is normally excreted.

Feeding the patients nitrogen containing foods but no native protein did not diminish the amount of nitrogen or the character of the stool. The administration of pancreatic extract caused a diminution in the bulk of the stool and less excretion of nitrogen, but did not affect the excretion of the fats. This is readily understood since most of the pancreatic extracts put out today have high proteolytic activity but are low in lipolytic activity. Farber has shown that the bulk of the stools and the excretion of fat and nitrogen can be reduced to practically normal if the patient is fed exclusively on casein hydrolysate, condensed milk, and water soluble vitamins.

2. Just as in diabetes, hormone replacement is essential, so in this condition the administration of pancreatin is indicated.

#### SUMMARY

Six cases of meconium ileus are briefly reported. The pathological picture, surgical and medical management are discussed. Notable progress has been made in relieving the obstructive meconium from the gastrointestinal tract, but at present prognosis is hopeless until products are available which will completely replace the external secretions of the pancreas.

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## THE TREATMENT OF DELIRIUM TREMENS

JAMES A. WALLACE, M. D.\*

MEMPHIS, TENN.

Delirium tremens is the most frequent of the several types of psychoses due to alcohol. Although the exact etiological factor in the production of this disease is not known, some investigators feel that a de-

ficiency of vitamin B is responsible. It is certainly a rarity to see a chronic alcoholic who uses anything like an adequate diet. Since the routine use of large doses of vitamin B has been employed in the treatment of alcoholics, a definite decrease in the incidence of delirium tremens has been noted.

The psychosis usually occurs in chronic alcoholics after prolonged periods of excessive drinking and poor intake of food. The sudden withdrawal of alcohol as the cause of the condition has been stressed in the past but is probably the apparent cause rather than the real cause. In the prodromal stage the patient is tremulous, sleepless, may complain of nausea and vomiting, and therefore, may have a distaste for alcohol as well as for food. Apparently infections or fractures may precipitate a delirium. An example of such a case was a 55 year old man who had used a quart of whiskey a day for about four years. He was transferred to the sanitarium from a general hospital where he had developed severe delirium tremens shortly after a cast was applied to a fractured femur.

In the typical case the patient appears frightened or even terrified. Generally he is agitated and reacts to stimuli in his environment. He may be confused and disoriented for time and place. The vivid visual hallucinations are among the outstanding mental symptoms. According to the usual description, rats, snakes, and various other animals are usually seen, but in our experience, the hallucinations are more often of human beings. One patient stated that he had just seen and talked with his family doctor. Another patient stomped on imaginary rats in the corner in his room. A 25 year old boy, at the onset of his delirium, was observed to carefully place newspapers in the chair before being seated, "because there's a pool of water in it." Another patient was amused and smiled frequently at an imaginary circus performance on the front lawn in which the performers were "little men and little animals."

Visual illusions may be present in which certain objects seen by the patient become



animate beings that threaten his safety. Tactile hallucinations are sometimes present; the patient feels insects crawling on his skin and may go through the motion of brushing them off.

The course of delirium tremens is from a few hours to several days, depending on how soon adequate treatment measures are instituted. The mortality rate, as reported by various clinics and hospitals, varies from 4 to 15 per cent. Death usually results from heart failure or pneumonia. A rare case may continue into a Korsakow's psychosis, which is a prolonged illness characterized by disorientation, amnesia with confabulation, and peripheral neuritis.

The chief problem in treatment is to secure adequate relaxation, sleep, and fluid intake, before the patient dies from heart failure. Alcohol should be discontinued at once. If possible, restraint should be avoided as the patient may die from exhaustion if struggling under various mechanical devices. Paraldehyde in 3 to 4 dram doses is the sedative of choice and is better tolerated than are other sedative drugs. Morphine, because of its depressant action, is contraindicated. The continuous bath is useful as a sedative measure. At this sanitarium the delirious alcoholic is routinely started on digitalis. A valuable aid in the treatment is the intravenous injection of 100 cc. of 50 per cent glucose with 25 units of insulin and 100 mgm. of thiamine chloride. This glucose-insulin-vitamin combination has been found to abort some attacks in the prodromal period and to terminate others in the early stages. Fluid intake must be maintained at an adequate level by either the oral or intravenous route. Saline catharsis should be used in order to promote proper elimination. We have seen no particular benefit from spinal fluid drainage as recommended by some investigators. Needless to say, constant nursing care is absolutely essential.

The usual termination of the psychosis occurs when the patient is able to sleep a few hours. The sooner sleep is brought about by the above treatment methods, the sooner will recovery take place. After re-

covery from the acute psychosis the patient should be maintained on large doses of vitamin B and on a nutritious diet.

The patient with delirium tremens is an emergency medical problem and is in need of immediate hospitalization and medical care.

#### SUMMARY

1. A description of the symptoms of delirium tremens has been given.
2. The routine treatment of such cases at the Wallace Sanitarium is described.

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### ACUTE EYE DISORDERS AS SEEN IN GENERAL PRACTICE\*

A. PENN CRAIN, JR., M. D.

SHREVEPORT

This paper will not interest eye specialists. It is designed primarily as an aid and a guide to the physician engaged in general practice who occasionally is called upon to treat an acute eye, and as it is impossible to give a detailed description of all the conditions one may encounter, I propose to discuss only the most serious.

#### CONJUNCTIVITIS

The most common cause of red eyes is conjunctivitis of one form or another. Some may be dismissed with little treatment while others are serious and must be watched closely.

Many texts group the types of conjunctivitis as: (1) catarrhal, (2) mucopurulent, and (3) purulent. I have grouped the catarrhal and mucopurulent together because the two conditions are often identical. Indeed, the mildest catarrhal conjunctivitis can become the most purulent if the resistance of the body is lowered or if the eye is badly treated.

The usual acute catarrhal or mucopurulent conjunctivitis is caused by a number of organisms, notably the *Kochs-Weeks bacillus*, *Morax-Axenfeld bacillus*, *staphylococcus aureus*, and *pneumococci*. This type is also found in association with some

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of the systemic virus conditions such as measles.

Characteristic findings are fiery red edematous conjunctiva, all the conjunctival vessels being injected except the circumcorneal zone in milder cases. At times there is even swelling of the palpebral conjunctiva. Mucopurulent material may be scanty or fairly profuse and when seen is found in the fornices and on the lid margins.

At first the discharge is mucoid but soon becomes mucopurulent. It reaches its height in three to four days, then tends to become chronic if untreated. Subjective symptoms consist of the sensation of a foreign body in the eyes, burning, itching, photophobia, lacrimation, and the lids are usually matted together in the mornings. Although diagnosis is usually simple, some cases of conjunctivitis are mistaken for iritis or vice versa, so that it is best to examine each case with magnification. The pneumococcal conjunctivitis, though clinically indistinguishable from other forms of acute conjunctivitis, shows distinct tendencies which should be borne in mind since this type is more prone to cause hypopyon ulcer. There is usually more edema of the conjunctiva and small ecchymoses are common. A membranous film occasionally forms and this type may be complicated by an iritis.

Treatment of this usually consist of washing the lids free from all secretion two or three times daily and application of sulfathiazole ointment, or sulfadiazine ointment, in the conjunctival sac twice daily, associated with a solution of 6 to 8 per cent sodium sulfadiazine drops flushed through both eyes. Dark goggles will relieve much of the photophobia. We do not use penicillin either in the form of drops or ointment because so often it causes a reaction in the lids. The lids become red, swollen, and tender, and may be moist. The *Kochs-Weeks* type (pink eye) deserves mention because of its extremely contagious nature.

#### PURULENT CONJUNCTIVITIS

Purulent conjunctivitis is characterized by copious yellow discharge and swelling of the lids and conjunctivitis. Usually

there is fever and rather marked malaise. The cornea is involved in nearly 100 per cent of the cases that are not treated and may be severe enough to cause blindness. The disease is more serious in adults than in children and is nearly always due to the gonococcus, *B. coli*, or streptococci infections.

Streptococcal infections are even more virulent than gonorrhea because of corneal damage. Treatment for the condition is drastic. In spite of possible reactions, I use penicillin locally and intramuscularly. The local drops contain about 1500 units per cc. A heavier concentration can be used if desired along with 8 per cent sodium sulfadiazine drops altering the solution every hour. The eye must be kept clean and the patient isolated. If corneal ulceration occurs, atropine 1 per cent, three times daily, is used along with fever therapy in adults. Fortunately, true purulent conjunctivitis is rather rare.

Needless to say, when at all possible, in an acute conjunctivitis a smear or epithelial scraping of the conjunctiva should be examined because in the very early stages it is frequently difficult to differentiate the acute catarrhal or mucopurulent conjunctivitis from the frank purulent types. This promotes an early diagnosis, and therefore, treatment is much more effective.

As conditions affecting the cornea, anterior chamber, iris, or ciliary body usually in some way affect the other structures they should be considered together.

Probably the second most common cause of acute eyes is neglected corneal foreign bodies, especially if these are iron or steel. These foreign bodies may cause few symptoms at first, but almost invariably they will set up enough irritation in the anterior segment of the eye to cause intense pain, marked conjunctival redness, lacrimation, and photophobia. This then becomes the picture of an iridocyclitis associated with an area of keratitis about the foreign body. Naturally any foreign body on the cornea should be removed as quickly as possible. These frequently leave a little rust ring



which can be more easily removed in a day or two.

Any penetrating injury should be treated as an acute eye as these injuries, especially if the injured eye becomes inflamed, may cause sympathetic disease in the opposite eye. Sympathetic ophthalmia, when it occurs, always follows penetrating injuries.

Corneal ulceration from causes other than foreign bodies produces acutely inflamed eyes. The most common is the marginal type. These are usually catarrhal in nature and found in debilitated persons. They are a rather common complication of acute catarrhal conjunctivitis. They begin as minute, punctate, discrete, and superficial grayish infiltrates of the cornea at the limbus. Soon the infiltrates become ulcers. All corneal ulcers cause some degree of deep conjunctival injection. I like to cauterize these ulcers with tincture iodine and precipitate the iodine with cocaine. It is thought that it does as well and causes less scarring, while it is also less dangerous to use than carbolic or trichloroacetic acid.

It is important in all cases to test corneal sensitivity with a small wisp of cotton as occasionally an ulceration which does not respond to treatment will be found to be due to loss of corneal sensitivity. This is the neuroparalytic keratitis sometimes seen, and is due to disturbances of the trigeminal nerve which supplies the cornea. These cases are marked by extreme chronicity and require treatment over long periods of time.

In general, the procedure to be followed after diagnosis of corneal ulceration is to treat the ulcer to prevent spread, by cauterizing with actual cautery, iodine, trichloroacetic or carbolic acid. The extent of ulceration can be determined by instilling one drop of 1 or 2 per cent fluorescein, or 1 per cent mercurochrome, in the eye and after a moment or two wash it out with water or saline. This shows any break in the continuity of the epithelium as a green area. If there is any doubt as to how to treat the ulcer a standard text should be consulted or the case referred to an eye

specialist as these ulcers can, and sometimes do, destroy the eye.

#### UVEITIS

Inflammations of the iris and ciliary body constitutes a good percentage of the patients seen in my office. A strict iritis or cyclitis by itself is pretty rare and the inflammation of one is almost always associated with inflammation of the other so that the condition is really an anterior uveitis or iridocyclitis.

In these cases the pupil becomes contracted and immobile and if the posterior surface of the cornea is viewed with slight magnification, minute pigmented bodies are found. They are the K. P.'s or keratic precipitates. The iris becomes bound to the lens by fibrinous adhesions and these synechia can be quite troublesome. If the iris is bound to the pupil in the whole circumference of the pupil, the flow of fluid from the posterior to anterior chamber is obstructed. This causes the iris to be ballooned out making the anterior chamber very shallow. Also, the fluid in the anterior chamber which has become filled with cells and fibrinous material causes a blockage of the filtration angle so that the aqueous cannot escape freely from the anterior chamber and the tension rises accordingly.

In most acute cases there is an intense ciliary blush associated with deep conjunctival injection, chemosis of the conjunctiva, and even swelling of the upper lid. In addition to severe local pain and radiating neuralgia there is increased tenderness in the ciliary region. The diminution of vision caused by the haziness of the media may be accentuated in some cases by optic neuritis or edema of the macula. This condition is serious. Changes occurring during its courses are often permanent. Therefore, prompt diagnosis and treatment is essential. Iridocyclitis is caused by injuries to the eye and by foci of infection in other parts of the body. For those cases occurring spontaneously a thorough and diligent search should be instituted for the focus that is causing it.

Fever therapy in the form of boiled milk or typhoid antigen should be started. After the active fever stage caused by the foreign

protein, salicylates can be used. Many use salicylates routinely and it has been adequately proved that salicylates do have a beneficial effect on these so-called spontaneous cases. I like to prescribe salicylates as the condition is cooling off, reserving the fever therapy, full atropinization, and hot compresses, to the acute stage. The intra-ocular tension should be checked, bearing in mind that one may mistake an acute glaucoma for an acute iridocyclitis if care is not used in examining the eye. If one is sure that the condition is an iridocyclitis, even though the intra-ocular tension is raised, atropine is to be prescribed.

#### GLAUCOMA

In acute glaucoma, however, atropine is positively contra-indicated as atropine cannot be counteracted in the eyes and it will increase the severity of the glaucoma and cause loss of the eye. Atropine should always be prescribed with the greatest of caution.

Acute glaucoma is characterized by the intense redness, steamy cornea, and cloudy anterior chamber that marks iridocyclitis. However, the pain is much more severe. Further characteristics are that the eye is stony hard, and all vessels, superficial and deep, are injected. The pupil is often a guide to diagnosis and in these cases is widely dilated and greenish in color. Vision is rapidly lost. Every effort is made to contract the pupil so that more space is made at the filtration angle. Blind eyes with acute glaucoma often have to be enucleated to relieve pain.

When suppurative endophthalmitis has progressed so that all the coats of the eye are involved in purulent inflammation, panophthalmitis is the result. The lids are red and edematous, the bulbar conjunctiva is swollen, the eyeball is proptosed, and there is severe pain. Pus obliterates the anterior chamber and vitreous so that the whole anterior chamber appears yellow. If the panophthalmitis follows a perforating injury the symptoms are less severe as there is more drainage. Unless these eyes are eviscerated, the globe frequently ruptures,

the eye becomes shrunken and phthisis bulbi results.

### PURPURA PRESUMABLY DUE TO HOUSE DUST

#### CASE REPORT

B. G. EFRON, M. D.

NEW ORLEANS

W. R., age 6, referred by Dr. Herbert Rothschild, was first seen by me on September 30, 1946. The diagnosis was non-thrombocytic purpura.

*History:* Since the age of 7 months, the boy had repeated ecchymoses and hemarthrosis with other related and minor hemorrhagic manifestations occurring irregularly at about two month intervals and apparently having no relation to season, diet, or environment. For several months prior to the time I saw him, it seemed as though these hemorrhagic episodes were associated with colds. The family history was negative for allergic or hemorrhagic disease.

The laboratory data was as follows:

	1/6/44	1/26/44	2/3/44	2/8/44
Bleeding time	19' 29"	4' 43"		4' 10"
Coagulation time	7' 13"	3' 52"		3'
Reticulocytes	0.5%			0.5%
Platelets	683,680			385,480
Hematocrit	32			
R. B. C.	3,840,000			4,190,000
Hemoglobin	69%			
Color Index	.9			
W. B. C.	12,200			
Neutrophils	69%			
Lymphocytes	29%			
Monocytes	2%			
Plasma proteins				
	Total	6.984	per 100	c.c.
	Albumin	4.01	" "	" "
	Globulin	2.974	" "	" "
	Fibrinogen	.515	" "	" "

Clot retraction complete in 6 hours

Tourniquet test negative

Transfusions had been given about every month since early in February 1944. With several of these, there were marked urticarial reactions.

From the standpoint of allergy, the his-

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tory was that the boy sneezed a great deal, had a postnasal drip, especially at night, and during cool weather his nose was affected by the slightest change in weather. "Allergic salute" was present. Dusts induced sneezing.

*Skin Tests (Scratch): Showed definite moderate to large reactions with house dust. Slight reactions were obtained for horse and dog dander.*

*Therapy:* Allergen avoidance for reacting substances was recommended, and desensitization with house dust antigen was instituted Oct. 29, 1946. On Nov. 16, 1946, a transfusion was necessary, another on Dec. 28, 1946, and one on Feb. 22, 1947, hemorrhages having recurred. Since Feb. 22, 1947, with continued desensitization, no transfusions have been necessary, although on two occasions, Oct. 18, 1947 and Jan. 17, 1948, mild joint hemorrhages did occur.

#### SUMMARY

A case of purpura of the nonthrombocytic type is presented that is apparently due to house dust.

Desensitization with house dust antigen successfully controlled the symptoms.

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### THE POSSIBILITY OF A PROVOCATIVE TEST IN ALLERGY\*

#### CASE REPORT

STANLEY COHEN, M. D.

NEW ORLEANS

The problem of the young asthmatic with negative skin tests is not an uncommon one. These patients have all the criteria of allergic respiratory disease due to extrinsic sensitizing agents, but fail to produce skin tests to the offenders which would be anticipated from their history. In my experience the majority of these patients are infants or young children.

Where the disease is of no great severity, it has been my policy to advocate

symptomatic management rather than empiric desensitization.

I was quite surprised to note the appearance of skin tests at about the third month of empiric desensitization in the following cases.

S. M. age nine, began to have asthma at the age of five years. At that time he lived in Chicago. He was seen by a well known allergist there, reported to be skin test negative and his parents were advised to have him treated with a vaccine. This was never done. He had several attacks of asthma between then and the time I saw him, including two attacks of status asthmaticus. The majority of these attacks occurred in the fall and spring and began at night. I saw him first in the spring of 1946 in the hospital in severe status. The same thing occurred in the fall of 1946. After two attacks of status, I felt that empiricism was justified, and proceeded to treat him as a house dust problem. I found him to be skin test negative twice, the last time just before beginning treatment. I was very surprised during the second month of his injections to notice that he was getting whealing reactions at the site of injection. I therefore skin tested him and found that he had developed a moderately positive scratch test to purified house dust. He has subsequently sustained two constitutional reactions occurring about fifteen minutes after an injection. His positive skin test persists.

Since then I have noticed the same phenomenon to occur in two other children. They likewise developed positive scratch tests around the second or third month of desensitization. One is a child of two; the other, a child of seven. The former had asthma for one year; the latter for three.

It is interesting to speculate regarding the mechanism of this response. I believe we can dismiss the possibility that these individuals were actually sensitized to house dust artificially. In so far as I know this has never been reported, and if it did occur, I should believe it would take longer with such a poor antigen.

We have all had the experience of inadvertently increasing the immunological sensitivity of a patient. I studied the records of three patients in whom after a constitutional reaction I was forced to drop back in the schedule to a dose which had been passed without reaction. In two of these patients this had happened about the third month; in the other about six months.

\*Read at the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 12-14, 1948.

There was no doubt that the immunological sensitivity of these patients was increased by treatment instead of decreased. This of course had no parallel in their clinical progress.

In 1940, Sherman, Stull and Cooke\* reported that there was a definite increase in circulating reagin in some treated patients. Four patients whose sera were titrated by the dilution test manifested this increase at two or three months of treatment. With further treatment these cases showed a drop in reagin so that at the end of two to five years most cases showed less circulating reagin than before treatment.

If an increase in circulating reagin is produced in the first few months of treatment, then perhaps empiric treatment may be justified as a provocative measure in patients whose pretreatment circulating reagin is below the threshold necessary to produce positive skin tests.

\*Sherman, W. B., Stull, A., and Cooke, R. A. *Serologic changes in hay fever cases treated over a period of years*, J. Allergy: 2:225, 1940.

## SUBACUTE DISSEMINATED LUPUS ERYTHEMATOSUS

REPORT OF A CASE TREATED WITH PARA-AMINOBENZOIC ACID

DAVID F. BRADLEY, M. D.

NEW ORLEANS

Lupus erythematosus is still included among that large group of diseases of unknown etiology.<sup>1</sup> Because of this, the treatment of lupus erythematosus in all of its manifestations has been largely empirical, and successful therapeutic results in the severer forms of the disease have not been frequent. In the past few months drugs that heretofore have had only limited clinical investigation have come into prominence in the dermatologic literature, and this investigation has been principally in the diseases of collagenous tissue, among which competent authorities place lupus erythematosus.<sup>2</sup> One of these drugs is para-aminobenzoic acid which was intro-

duced for the treatment of lupus erythematosus by Zarafonitis et al.<sup>3, 4</sup> Little is known about the pharmacodynamic action of PABA. It is known, however, that it is a sulfonamide antagonist, that it is an effective sun screen,<sup>5</sup> that it detoxifies indol, and that it is effective in the treatment of some of the rickettsial diseases.

The case that is being reported is classified as subacute disseminated lupus erythematosus. It is felt that this report is important because the prognosis for this patient prior to PABA therapy was regarded as extremely poor and on institution of this form of treatment the patient exhibited an unexpected and remarkable clinical remission.

### CASE REPORT

O. M., 38 years old, white male, was first seen on August 31, 1948. At that time the disease had been present for six years. He first became aware of a cutaneous abnormality in 1943 while he was a serviceman, when after prolonged exposure to the sun he became severely sunburned and the sunburn persisted for several weeks. This caused him no great inconvenience until March 1948 while painting the outside of a house. At that time blisters appeared on his hands, spreading to the face, forearms, arms, neck, and chest, in a period of three to four weeks. He consulted his local physician who gave him a series of intramuscular injections of unknown nature but these failed to influence the course of the disease. For the five months prior to admission the patient stated that he had been having daily bouts of fever which he recorded as high as 104° F. on a clinical thermometer. He also experienced moderately severe joint pains, especially in the shoulder region during the five months before admission.

The patient's past history revealed that he had had typhoid fever in 1934 and syphilis in 1925. For the latter he received seven intravenous injections. Numerous serologic tests for syphilis had been negative since that time. His family and marital histories were not contributory. On admission to the hospital the patient's temperature was 99° F., pulse 100 per minute, and blood pressure 100 mm. systolic and 60 mm. diastolic. At that time he appeared chronically ill and emaciated. On his arms, forearms, front and back of neck, face, and dorsum of hands there were erythematous, scaly, papular lesions that coalesced to form plaques. Examination of the individual lesions revealed telangiectasis, pigmentation, loss of hair, and atrophy of the skin to produce a picture not dissimilar to poikiloderma. There was a generalized shotty, nontender lymphadenopathy. Examination of the heart, lungs, abdomen, peripheral

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and cranial nerves, as well as the eyes, ears, and mucosa were not remarkable.

**Laboratory findings:** On admission serologic tests for syphilis were negative. A urine specimen was reported as having 10-16 erythrocytes per high power field but was otherwise negative. Subsequent urine examinations were within normal limits. Serum proteins were 5.90 Gm. per cent, with 3.8 Gm. globulin, and 2.1 albumin. Blood creatinine was reported as 1.2 mg. per cent. There were 3,900,000 erythrocytes per cu. mm. of blood and 6,150 leukocytes with a differential count of 43 per cent lymphocytes, 34 per cent polymorphonuclear leukocytes, 5 per cent monocytes and 18 per cent eosinophiles. A roentgenogram of the chest was reported as showing no evidence of pulmonary pathology. A specimen of skin obtained by biopsy was reported as lupus erythematosus.

The patient's hospital course was uneventful, his temperature remaining between 99° F. and 100.5° F. until September 9, his ninth hospital day, when he began to have daily exacerbations of fever to 102 and 103° F. During this time only general supportive treatment, including liver extract, vitamins, and bismuth subsalicylate, was administered. Triweekly white blood cell counts up to this time had been between 5,000 and 10,000 per cu. mm. with a persistent moderate increase in eosinophiles. On the twenty-eighth hospital day it was noted that the patient appeared extremely ill and the cutaneous lesions had begun to disseminate, bright red lesions appearing under the nail plates, on the finger tips, palms, and over the abdomen. These lesions represented capillary dilatations as they could be obliterated by pressure. At this time the patient was having frequent bouts of fever up to 104° F. and the joint pains which had improved during the early part of his hospital stay had become much worse. Thirty-seven days after admission PABA was begun. He was given 10 grams daily by mouth in five equally divided doses. The bright red skin lesions began to fade in two days and had completely faded in twelve days. The daily bouts of high fever persisted, however, and the leukocyte count fell to 3,000 per cu. mm. It was felt that PABA might be causing the leukopenia and the drug was discontinued after fifteen days. A transfusion of 500 cc. of whole blood was given at this time in an effort to correct the leukopenia and the persistent anemia. Two days after the discontinuance of the PABA therapy the patient's temperature became normal and remained nearly so until discharge on November 19, 1948, eighty days after admission. A total of 150 Gm. of PABA had been given to this patient in fifteen days. He has been observed continuously since the time of discharge and has remained well with no new exacerbations of his skin disease, the only abnormal laboratory findings being a persistently elevated sedimentation rate, between 18 and 35 mm. per hour corrected, and a marked

sensitivity to ultraviolet light. On testing, a minimal erythema could be produced on his skin in one-third the normal reacting time of several controls of similar complexion. In the last few weeks PABA therapy was reinstituted in doses of 10 grams daily by mouth and the patient retested for light sensitivity. The hypersensitivity to ultraviolet light was not influenced.

#### SUMMARY AND CONCLUSIONS

1. A case of subacute disseminated lupus erythematosus treated with PABA is presented with the physical and laboratory findings described in detail.

2. PABA, while not effecting a cure, is thought to have caused remarkable regression of the skin lesions in the case reported.

3. PABA, has not altered the patients' fundamental light sensitivity, nor did it influence the prolonged hyperpyrexia.

4. It is suggested that PABA is a valuable drug in the treatment of disseminated lupus erythematosus, but as a sole therapeutic agent it cannot be relied upon to cause remission of all aspects of the disease.

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#### DISCUSSION

Dr. Leslie K. Mundt (New Orleans): When Dr. Bradley asked me to discuss his paper, I agreed to do so but only after informing him of my extremely limited personal experience in the treatment of lupus erythematosus with para-aminobenzoic acid.

As you know, for purposes of discussion and teaching, lupus erythematosus is ordinarily divided into four groups: (1) discoid lupus in which the lesions are localized and confined to the face, scalp, or mucous membranes; (2) chronic disseminated discoid in which the plaques are widespread without systemic involvement; (3) subacute disseminated in which systemic involvement is exhibited; (4) and acute disseminated lupus erythematosus.

I have personally treated 2 cases of disseminated discoid lupus erythematosus with PABA. The first case was disappointing in that no clinical response at all was noted. In retrospect, I now believe treatment failure can be attributed to insufficient dosage administered over too short a

period of time. The second case, also one of chronic disseminated discoid, is now under treatment and is showing improvement under the recommended larger dosage.

The original work of PABA in the treatment of lupus erythematosus was done at Ann Arbor, Mich. This group reasoned along the following lines: (1) It is well known that exposure to ultra-violet light may exacerbate lupus erythematosus; (2) sensitivity to sunlight is also encountered in patients receiving sulfonamides; (3) PABA and sulfonamides are metabolic antagonists; (4) therefore, PABA might produce a beneficial effect in lupus erythematosus.

As I understand it, the drug seems to be least effective in the two extremes of the disease; namely, the benign discoid form and the frequently fatal acute disseminated variety. Results in chronic disseminated discoid lupus erythematosus have been more encouraging and the best results have been attained in the subacute disseminated forms. Dr. Bradley's paper attests to this. It should be remembered that lupus erythematosus is an unpredictable disease and the causal relationship between therapy and response is not easy to evaluate. However, in the 18 cases reported by Zarafonetis, Grekin and Curtis the improvement following PABA was consistent enough to be convincing.

The drug apparently is not without danger. Leukopenia, drug fever, rash, fatigue, and weakness must be anticipated. One case of fatal toxic hepatitis has been reported. The glycosuria encountered frequently in patients receiving 18 or more grams daily of the drug represents a renal glycosuria and is of no clinical significance.

Rein treated 13 unselected cases of lupus erythematosus and found the drug of no value. I believe, however, the results to date are encouraging enough to warrant additional studies with the drug.

## THE X-RAY IN THE DIAGNOSIS OF TUBERCULOSIS\*

J. E. BLUM, M. D.  
GREENWELL SPRINGS

Today the x-ray is being used more and more to aid in the diagnosis of tuberculosis. Most states have photofluorographic units and some hospitals are now using this device to screen all admissions. Many physicians have, or have access to, x-ray equipment. The tendency to depend on x-ray for diagnosis, leaving out the other important features of the case,—history, physical and

laboratory work, is greater than formerly. Being tuberculosis conscious is commendable, but making the diagnosis on a single film is not scientific. Inaccurate diagnosis may work hardship on the individual. Tuberculosis is still a stigma to the laity.

There are many conditions which on x-ray film simulate tuberculosis. The pneumonias, histoplasmosis, carcinoma, sarcoidosis, pneumoconiosis, lung abscess, and various other diseases can be erroneously called tuberculosis.

To make the diagnosis, a careful history and physical examination, laboratory and x-ray, must be studied together. If the physician depends on history alone, 80 to 90 per cent of the cases are far advanced by the time a diagnosis is made. Rales may or may not be present on physical examination. Chromogenic nonpathogenic acid-fast organisms may be found in the sputum. Soft shadows on a single film may mean several conditions, as outlined above. Thus, it is seen that a good x-ray with the other factors is needed for diagnosis.

### ESSENTIAL FACTORS WHICH MAKE IT POSSIBLE TO TAKE A GOOD X-RAY PICTURE

1. Milliamperage (M.A.) passing through the tube.
2. Kilovoltage (K.V.) applied to the tube.
3. Time of exposure.
4. Distance (target-film).
5. Approximation of part to film.
6. Immobilization of part.
7. Uniformly sensitive films and screens.
8. Standard positions.
9. Proper dark room technic.

The photographic effects may be represented by  $P. E. = \frac{M A X T X K V^2}{D^2}$ .

The above may seem academic, but since many physicians are taking and processing their own x-rays, I feel the time is appropriate to point out many faults and how to correct them.

1. Milliamperage. Too frequently films are taken with small portable units and those advertised as capable of taking chest films. The Greenwell Springs Hospital uses 200 milliamperes for routine chests and 100 milliamperes for planigraph.
2. Too frequently, the kilovoltage is not

\*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.



right, either too high or too low, unless of course, a photoelectric densiometer is used. For photofluorography the photoelectric cell is used. Otherwise, obstetrical calipers are used to measure the thickness of the chest. The same spot on each individual should be used, for example, the angle of Louis.

3. 0.2 second is used unless the Potter Bucky diaphragm is not used and, then 0.1 second is used. The vertical Potter Buckey is routine at Greenwell Springs Hospital.

4. Six feet is the distance used, since there is less distortion and the rays are almost parallel. Shorter distances tend to distort the shadows of the chest; the heart is larger, as are cavities and spots. One can hardly compare two films taken at different distances.

5. The part to be examined must be close to the film. There is marked difference if the lesion is in the left chest and a right lateral is taken. Also, the difference in E. P. A. and E. A. P. is striking enough in my opinion to warrant a change in the usual position since 75 to 90 per cent of lesions are in the posterior half of the chest. E. A. P. gives more information. This can also be nicely demonstrated by fluoroscopy—have the individual's back to the screen.

6. Immobilization of the part is essential, as movement causes a poor film. Even the motion in the heart in a long exposure is noticeable.

7. One should use the same brand of film (if possible) and, at least, the same speed screens.

8. The standard positions of E. P. A., E. A. P. left, and right lateral and obliques are used, and naturally the position of the tube must be centered on the center of the cassette and patient. The patient is instructed to take a deep breath and hold until exposure is made. Sometimes in marginal pneumothoraces, the lung fills the pleural cavity and no space is seen. Consequently, exposures in expiration are made at intervals, remembering that the diaphragms are elevated and the lower third of the lungs may appear as containing exudative lesions.

9. The cassette must be opened in dark-

ness and a good safe light used, or fogging may occur. Develop for three and a half minutes in solution which has been agitated and kept at 68 F. Solutions should be made fresh at least every sixty days. Replenisher may be used, only 3 gallons for a 10 gallon tank, enough solution to completely cover the film on hangers. Fix from five to fifteen minutes, depending on age of fixer. Wash in *running water* for at least thirty minutes. The care of cassettes is important. When dirty spots appear on completed films, the interior of the cassettes should be inspected. Screens may be brushed with a camel hair brush and washed with ivory soap and water. Care should be used in placing films in cassettes so as not to close cassette on film.

Besides the E. P. A. and E. A. P., laterals right or left, remembering that the lesion should be close to the film, are used to locate lesions and adhesions. Obliques also are very helpful in locating lesions in the left chest, and adhesions.

The planigraph in my estimation, is far superior to stereoscopy. Since few machines can take two exposures in the same phase of respiration and cardiac cycle and since few people can truly see stereoscopically, body section x-ray should be used more and more as the equipment becomes better known.

#### CONCLUSIONS

1. The x-ray taken with the essential factors correctly applied, should help to further the early diagnosis of tuberculosis.

2. Too frequently, one, several and sometimes all of the essential factors are overlooked.

3. Too much emphasis is being placed on a single x-ray. Sometimes several must be taken to complete the diagnosis.

4. Body section x-ray is to play a more important part in diagnosis.

5. The laxity in not applying the essential factors must be corrected so that readable films will aid in the diagnosis of tuberculosis.

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## NEW ORLEANS

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## THE TIME IS NOW—

## THE RESPONSIBILITY IS YOURS

By DR. H. WHITNEY BOGGS,  
Secretary Louisiana Physicians Service

On September 19th, and continuing for two weeks, the Blue Shield and Blue Cross Plans of Louisiana will conduct a state-wide Individual Enrollment Campaign. During this period, persons not covered by these plans under a group contract, may enroll as individuals or in family groups by paying a three month premium in advance.

You all know—but too many of you are inclined to forget—that the Louisiana State Medical Society, has made possible the for-

mation of a voluntary medical-cost insurance program, operated on a non-profit basis, owned and endorsed by the State Medical Society and officered by and directed by doctors who donate their time.

Much criticism, and recently some praise, has been leveled at the men whose time and effort have been given to make L. P. S. a success. One of the most frequently voiced criticisms has been, "Why can't *all* the people buy insurance—why must it be sold only to groups?" To this we have been forced to reply that when the financial position of the company justified it, and our actuarial experience was such that we could anticipate and plan on our utilization in an orderly manner, then, and only then, could we enroll individuals and family groups without the necessity of their meeting group requirements. We have all worked hard to reach this goal and we are happy to say that, in good time, it has been reached—The Time is *Now*!

But that is only *half* the battle. Our plans are laid, policies printed and available, state-wide advertising campaigns mapped out, salesmen—those that we have—ready, the Blue Cross units cooperating in every way. On the face of things, it looks like a lead-pipe cinch to succeed. But will it?

Well, now—that *depends*. L. P. S. has had some rough sledding financially, but our position now is excellent—we are paying our way, and have recently improved our contract a great deal, because our profits went into reserves for the benefit of the public—the insured.

Our enrollment in the first six months of 1949 has been excellent—way beyond expectations, but we have been delayed many times—by the merger proceedings of the three upstate Blue Cross plans into the now functioning Louisiana Hospital service, for example. But our greatest single handicap, and that of our Blue Cross allies, has been the lack of competent salesmen to present our plan to employers.

That brings us up to now—*You wanted* individual enrollment. Now you *have* it. But, what are you going to do about it? Will you sell your Insurance, to your pa-

THE TIME IS NOW—THE RESPONSIBILITY IS YOURS.



tients, on *your* time? Are you willing to devote just 5% as much of your time to making our first Individual Enrollment Period a success, as your L. P. S. directors and officers donate of theirs in *your* behalf to make *your* insurance company successful?

You may say, "But I'm a physician—not a salesman" — Very true, as far as it goes — but unless we all do a selling job, someone else will have sold the American People an inferior bill of goods, marketed by the believers in the stultifying philosophy of "Something for nothing, from the cradle to the grave."

So, Doctors, *be* salesmen for a two week period. Use the material which will be sent to all of you. Urge *your* patients to get Blue Shield—Blue Cross coverage—only then, will *you* be doing *your* part. The plans are laid—the time is now!—but the responsibility is *yours!*

—o—

## HAS PRIVATE MEDICINE FAILED TO IMPROVE PUBLIC HEALTH?

By DR. WILLFORD I. KING\*

In the last two decades, maternal deaths connected with child-bearing have declined to only about one-fifth of the rate prevailing in 1930. Here we have a real triumph of medical science.

One can gain a more inclusive view by considering the average expectation of life of young women at the age of 25. In 1900, the average white girl of that age would live 40 years. Her granddaughter in 1946 could look forward to 46 more years—a gain of 6 years. The average colored girl of the same age in 1900 had an expectation of life of 34 years. In 1946, the corresponding figure was nearly 42 years—an extension of almost 8 years. Again, the figures show that health gains have been at least as

marked among the colored as among the white population.

But is it not true that most people in poor States like Mississippi are almost completely lacking in modern medical care. Official Government figures show the per thousand death rate for Mississippi to have been 12.7 in 1919 and only 9.2 in 1946—a drop of 3.5 points. During the same period in New York—the richest State in the Union—the death rate fell from 13.9 to 11.1—a decline of 2.8 points—materially *less* than in Mississippi.

What do all these figures indicate? Assuredly, they show that health progress under the existing system of treatment has been amazing. However, one must not jump to the conclusion that the average family does not need sickness insurance to take care of the heavy financial burden which may result in case of serious illness. Such insurance should be compulsory. But this does not mean that the Government must go into the insurance business. Sound private insurance companies are always seeking new policyholders. The Blue Cross and similar cooperative insurance concerns are expanding rapidly. Their charges, covering both hospital and medical service, are so low that the ordinary workingman can meet them without undue hardship. Why, then, do our political leaders feel Government entry into the sickness insurance field to be so imperative?

The obvious answer seems to be that such extension of Government activity will furnish many lucrative jobs for loyal party henchmen, and will give more power to bureaucrats. They naturally favor any scheme which will make the United States Treasury buy votes for them. How does this arrangement appeal to you who, as a taxpayer, must help to keep the Treasury in funds? Furthermore, will you enjoy having the Government control your medical service? These questions are worth thinking over.

\*Economics-Professor Emeritus, New York University; author of many articles and books on economics, including recent volume, "The Keys to Prosperity."

## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### REPORT OF AMA HOUSE OF DELEGATES MEETING

President and Executive Committee,  
Louisiana State Medical Society,  
New Orleans.  
Gentlemen:

At ten o'clock on the morning of Monday, June 6, in Atlantic City, the House was called to order by the Speaker, Dr. Borzell. The Chairman of the Reference Committee on Credentials reported 152 accredited members. Minutes of the interim meeting, held in St. Louis, were adopted as published.

Selection of the recipient of the distinguished service award was between Dr. Alfred Blalock, of Baltimore, Dr. Seale Harris, Birmingham, and Dr. Shield Warren, Austin. When the final vote was counted Dr. Seale Harris was declared the winner and was presented this award.

Two extra committees were appointed. One of these was the Committee on Prepayment Insurance and Medical Plans and to this committee Dr. J. Q. Graves was appointed.

Following remarks by the President and introduction of the President-elect, Dr. Elmer Henderson reported for the Board of Trustees. Dr. Henderson's statement in regard to the Editor of the Journal, Dr. Morris Fishbein is produced in full as follows:

"The Board of Trustees is aware of the criticism of the editor, coming from within and from without the profession. The Board recognizes that the public has come to believe that the editor is a spokesman of the Association. The membership undoubtedly wishes the elected officials to speak authoritatively on all matters of medical policy.

"Against the time when the editor retires, Dr. Austin Smith has for some months been in training as the assistant editor, and the talent of the editor will be retained for the present under the control of the Board of Trustees.

"In view of the increasing responsibility of the editor and reorganization of the department, the Board of Trustees has decided on the following points:

"1. The editor will completely eliminate speaking on all controversial subjects, both by platform and by radio. Approval of all speaking engagements will be made by the executive committee.

"2. Elimination of all interviews, including press conferences, and statements by Dr. Fishbein, except on scientific subjects.

"3. Editorials on controversial subjects will be supervised by the executive committee.

"4. Complete information as to these activities will be reported to the members of the House of Delegates.

"5. There will be permanent elimination of 'Diary in Tonics and Sedatives' (the Fishbein column).

"6. Plans for the training of a new editor in an orderly manner, including retirement of the present editor, will be formulated.

"The Board of Trustees of the American Medical Association announces that plans have been formulated for the retirement of Dr. Morris Fishbein as editor of 'the Journal of the American Medical Association' at an appropriate time. For thirty-seven years Dr. Fishbein has served the AMA well and faithfully. The Journal of the AMA is an enduring monument to his genius and devotion. His activities have been extended far beyond his immediate duties as an editor and the Board desires to pay tribute to his many accomplishments in other fields.

"The Board finds that serious dislocation would result from any sudden replacement. With this in mind, a reorganization of the editorial staff is under way, so that his retirement, when consummated, will not result unfavorably for ventures of the association."

Under the head of new business a great number of resolutions, referring to all types and problems of medicine were presented. Following this recess was taken.

The first order of business for the afternoon session was a report by the firm of Whitaker and Baxter. After listening to this report your delegates feel that the public relations and publicity of the AMA are in exceptionally good hands. It was suggested that a large size picture of "The Doctor", by Sir Luke Fildes, with the inscription "Keep Politics Out of this Picture" be sent to all doctors for display in their office. There were some very large billboard signs of this picture displayed on the boardwalk in Atlantic City and they were very well received. The picture is also to be used in every other way possible, for instance in moving picture houses, as slogans on postage meters, etc.

For the first time in some years Wednesday was open entirely for committee meetings and no special sessions of the House were held.

The resolution in regard to increasing payment for life insurance examinations was again dis-



cussed and finally referred back to the secretaries of the various state medical societies for further study and report.

The Committee on Liaison with the American Red Cross Blood Bank was continued and it was reported that by July 1, 1949 there would be 34 Red Cross Blood Centers in operation. A questionnaire has been sent to each of the 6,400 registered hospitals to learn where all blood banks are located and 5,600 replies have been received. A second questionnaire is being prepared to determine such points as capacity, type of organization, material used and charges made.

The resolution on appointment of a committee to study the problem of displaced physicians generally in furthering the settlement of these persons in the different states was referred to the Board of Trustees for further study.

A resolution to discontinue the annual general practitioner award, as introduced by the Connecticut State Medical Society, was defeated.

It was proposed that a study be made as to the possibility of admitting interns to membership in the AMA. It appeared, from the discussion, that this idea was well thought of and every effort will be made to provide for intern membership.

Attention was called to the fact that the Constitution has previously required that a doctor moving from one state to another should make application for membership in the state to which he has moved within one year or be dropped from the rolls of the AMA. This requirement has now been changed making it necessary to apply for membership in the state to which the doctor has moved within six months time.

A new section on physical medicine and rehabilitation was approved.

Disapproval was voiced against coverage of individuals, especially doctors under the Social Security Act.

A revised Code of Ethics for the medical profession was adopted, after several years of study, and we believe it will prove quite satisfactory. At the same time another Code of Ethics for the World Medical Organization was proposed.

The Scientific Assembly Council was increased to seven members, one of whom shall be a general practitioner, elected by the House of Delegates upon nomination by the Board of Trustees. The term of office of each member of this Council shall be seven years.

A recommendation was made that a two-year internship for general practitioners be established in hospitals and that general practitioners be given rights of staff members in all hospitals.

The following twelve-point program of the AMA was approved:

"1. Creation of a federal department of health of cabinet status with a secretary who is a doctor of medicine, and the coordination and integration of all federal health activities under this depart-

ment, except for the military activities of the medical services of the armed forces.

"2. Promotion of medical research through a national science foundation with grants to private institutions which have facilities and personnel sufficient to carry on qualified research.

"3. Further development and wider coverage by voluntary hospital and medical care plans to meet the costs of illness, with extension as rapidly as possible into rural areas. Aid through the states to the indigent and medically indigent by the utilizations of voluntary hospital and medical care plans with local administration and local determination of needs.

"4. Establishment in each state of a medical care authority to receive and administer funds with proper representation of medical and consumer interest.

"5. Encouragement of prompt development of diagnostic facilities, health centers and hospital services, locally originated, for rural and other areas in which the need can be shown and with local administration and control as provided by the National Hospital Survey and Construction Act or by suitable private agencies.

"6. Establishment of local public health units and services and incorporation in health centers and local public health units of such services as communicable disease control, vital statistics, environmental sanitation, control of venereal diseases, maternal and child hygiene and public health laboratory services. Remuneration of health officials commensurate with their responsibility.

"7. The development of a program of mental hygiene with aid to mental hygiene clinics in suitable areas.

"8. Health education programs administered through suitable state and local health and medical agencies to inform the people of the available facilities and of their own responsibilities in health care.

"9. Provision of facilities for care and rehabilitation of the aged and those with chronic disease and various other groups not covered by existing proposals.

"10. Maintenance of existing high standards of medical care for veterans including extension of facilities where need can be shown. Where practical, care of the veteran should be in his own community by a physician of his own choice.

"11. Greater emphasis on the program of industrial medicine, with increased safeguards against industrial hazards and prevention of accidents occurring on the highways, home and on the farm.

"12. Adequate support with funds free from political control and regulation of the medical and allied professional schools."

The Committee on Prepayment Medical Plans submitted the following 20 points as suggested principals for lay sponsored voluntary health plans.

which were approved by the House of Delegates:

"1. The Plan shall be non-profit, paying no dividends to beneficiaries or others; all surplus earnings shall be devoted either to improving the services, to making compensation of physicians and other staff members more adequate for their responsibilities and services, to purchasing facilities and equipment, to increasing the scope of benefits, or to building adequate reserve funds. All income to the Plan shall be devoted to services for beneficiaries.

"2. The Plan shall comply with the Principles of Medical Ethics of the American Medical Association which provide that it is unprofessional for a physician to dispose of his professional attainments or services to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body of individual employing him.

"3. If incorporated the Plan shall be adequately financed and organized without capital stock.

"4. The Plan shall be operated under an autonomous administration or trust, with segregated funds, and shall be devoted exclusively to the provision of health service.

"5. Promotion, sales, organization and administrative expense of the Plan shall be kept at a minimum as judged by the accrediting body.

"6. The quality of medical service shall be maintained at the highest possible level. All participating physicians shall be doctors of medicine duly licensed to practice medicine in any state in which the Plan operates. Each physician engaged in the practice of a specialty shall be required to have adequate qualifications for that specialty. The personnel and facilities of the Plan shall be adequate to insure a high quality of medical care.

"7. The Plan shall provide all services as set forth in the agreement with the beneficiary. When in the opinion of the medical staff, a professional service set forth is not available because of an emergency or because of the need for highly technical procedure, or for any other reason, then such service shall be otherwise provided by the Plan.

"8. The Plan, in its agreement entered into with the beneficiary and which shall be distributed to each beneficiary, shall state clearly the services and benefits to be provided and the conditions under which they will be provided. All exclusions, limitations, waiting periods and deductible provisions shall be clearly stated in the agreement with the beneficiary and in promotional and descriptive literature.

"9. The Plan shall, in its agreement with the beneficiary, state clearly the amount of dues or subscription to be paid. The amount of dues or subscription shall be adequate to provide for the benefits and services offered and to insure proper financing of the risks involved.

"10. No promotional material shall invite attention to the professional skill, qualifications or attainments of the physicians participating in the Plan.

"11. Participating physicians may be compensated in any manner not contrary to the Principles of Medical Ethics of the American Medical Association relating to contract practice.

"12. Any duly licensed physician in the community who wishes to participate in the Plan, who meets its professional and personnel standards, and who agrees to abide by its terms and the requirements of its beneficiaries, shall be admitted to the Plan.

"13. The names of all participating physicians of the Plan shall be made available to the prospective beneficiary. The beneficiary shall, within reasonable geographic and professional limitations, have free choice among participating physicians.

"14. There shall be no interference by the governing body with the medical staff in the practice of medicine. The traditional and confidential relationship of the physician and patient shall be preserved.

"15. Adequate provision shall be made for effective participation of the medical staff in the deliberations of the governing body. It is recommended that the membership of the governing body include representatives of the medical profession.

"16. All services rendered by the participating physician, not included in the beneficiary's contract, shall be payable by the beneficiary to the participating physician on a fee for service basis.

"17. The method of operation of any hospital owned or under contract to the Plan shall be in accordance with sound public policy.

"18. The plans shall provide for like rates, benefits, terms and conditions for all persons in the same class.

"19. Investment of reserve funds shall be made only in securities deemed prudent for such purposes.

"20. Any Plan desiring approval under these principles shall agree to such periodic reviews and to abide by such regulations as may be deemed necessary by an appropriate accrediting body of the American Medical Association in consultation with representatives of the sponsors of the Plan."

On Thursday Dr. Abel, a British Surgeon, was granted the floor to discuss socialized medicine in England. Unfortunately his time had to be limited, however the talk he was permitted to make was extremely interesting. He brought out the point that in the hospitals of England today there is a waiting list which requires a patient to wait twelve to eighteen months before admitted to the hospital. He tried to impress the delegates with the fact that we should advocate insurance for those who cannot pay but we should permit those able to meet their own obligations to have the power to contract for their own bills. He ably summed up



the British idea in one sentence when he said: "The British government does not trust the people to spend their own money but takes it from them and spends it for them."

On Thursday afternoon the election of officers took place. It was quite unusual that one of the New York newspapers stated in a Thursday morning edition that the new president of the AMA had been elected, before the nominations were made. Dr. Elmer Henderson, of Kentucky, was elected president, without opposition. We would like to call your attention to the fact that Dr. Francis J. L. Blasingame, of Texas, was elected to fill the place of Dr. Henderson on the Board of Trustees. The other officers elected are as follows: Dr. James Francis Norton, New Jersey, Vice-President; Dr. Frank Borzell, Pennsylvania, Speaker of the House; Dr. James R. Reuling, New York, Vice-Speaker of the House; Dr. Louis H. Bauer, Member of the Board of Trustees.

Your delegates feel that a lot was accomplished at this meeting and that future events will show the wisdom of some of the action of the House of Delegates at this session.

Respectfully submitted,

Val H. Fuchs, M. D., Delegate

J. Q. Graves, M. D., Delegate

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#### REPORT OF THE RURAL HEALTH COMMITTEE MEETING

Held in Alexandria, Louisiana

July 17, 1949, 2:00 P. M.

There was a joint meeting of the Rural Health Committee of the Louisiana State Medical Society with the Rural Health Committee of the Farm Bureau. The following members of the Rural Health Committee of the Louisiana State Medical Society were present: Dr. Guy R. Jones, Dr. M. C.

Wiginton, Dr. Lorenz Teer and Dr. J. P. Sanders. There was full attendance of the Rural Health Committee of the Farm Bureau and Miss Bascher of the Agricultural Extension Service and Dr. Trois Johnson were guests.

A considerable amount of discussion centered around the possibility of changing the name of the Rural Health Council of Louisiana. It was finally decided that we recommend to the Council that it drop the sole sponsorship of the Farm Bureau. Originally, when the Rural Health Council started, it was necessary that it have the backing of some one organization and that was the reason that it was called the Rural Health Council of the Farm Bureau. It was felt by the two committees that after two years of active operation the Rural Health Council was sufficiently strong to stand on its own; that since approximately thirty organizations were represented in the Council, it would be best to drop the name of the "Farm Bureau." It was felt that the Farm Bureau and the Louisiana State Medical Society will have to continue active participation in the Rural Health Council, in order to keep it functioning.

Plans for the future were discussed regarding a Rural Health Council meeting sponsored largely by the Louisiana State Medical Society. The Rural Health Committee of the State Medical Society felt that the State Medical Society would be willing to sponsor such program at anytime the Rural Health Council requested it. The coming Rural Health Council meeting to be held in Baton Rouge on August 16th and 17th, 1949, was discussed at some length and the Rural Health Committee went on record in requesting that all doctors in the state of Louisiana attend this important meeting, if at all possible.

J. P. Sanders, M. D.

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## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

#### CANCER RESEARCH FELLOWSHIP

The American Cancer Society has announced that Dr. Richard H. Corales, Jr., of New Orleans, La., assistant resident in neurosurgery, at the Duke University School of Medicine, has been awarded a Damon Runyon Clinical Research Fel-

lowship. The award, for one year, from July, 1949 to July, 1950, was made on recommendation of the Committee on Growth of the National Research Council.

Dr. Corales, a graduate of Tulane University School of Medicine, will participate in a Duke Uni-

versity research program, in the field of brain tumors, approved by the National Research Council, under the direction of Dr. Barnes Woodhall and Dr. Guy Odom, professor and assistant professor of neurosurgery.

#### NEWS ITEM

Dr. F. L. Jaubert was elected President of the Medical Staff of the Sara Mayo Hospital at its annual meeting held in June.

#### NATIONAL GASTROENTEROLOGICAL ASSOCIATION

The National Gastroenterological Association will hold its 14th Scientific Session at the Somerset in Boston, Mass., on October 24-26, 1949.

Among the outstanding speakers to present papers at the Convention are Dr. Owen H. Wangenstein, Professor of Surgery, University of Minnesota Medical School; Dr. Frank Lahey, Lahey Clinic, Boston, Mass.; Dr. William B. Castle, Boston, Mass.; Dr. George Crile, Jr., Cleveland, Ohio; Dr. Maxwell Finland, Boston, Mass.; Dr. J. M. T. Finney, Jr., Baltimore, Md., and Lord Alfred Webb-Johnson, President of the Royal College of Surgeons, London, England, who will be a guest of honor at the banquet to be held on Tuesday evening, October 25, 1949.

At the Annual Banquet to be held at the Somerset, the winner of the National Gastroenterological Association's 1949 Prize Award Contest for the best unpublished contribution on Gastroenterology or an allied subject, will receive the prize of \$100.00 and a Certificate of Merit.

Immediately following the Convention on October 27, 28, 29, 1949, the Association is sponsoring a course in Gastrointestinal Surgery at the Boston City Hospital.

Further information concerning the program and details of the course may be obtained by writing to the Secretary, National Gastroenterological Association, 1819 Broadway, New York 23, N. Y.

#### AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, INC.

The annual meeting of the Board was held in Chicago, Illinois, from May 8 to 14, 1949, at which time 236 candidates were certified.

New Bulletins, incorporating changes made at the recent meeting, are now available for distribution upon application and give details of all new regulations.

The next scheduled examination (Part I), written examination and review of case histories, for all candidates will be held in various cities of the United States and Canada on Friday, February 3, 1950. Application may be made until November 5, 1949. Application forms and Bulletins are sent upon request made to American Board of Obstetrics and Gynecology, 1015 Highland Building, Pittsburgh 6, Pennsylvania.

#### MEETING OF THE INTERNATIONAL SURGICAL SOCIETY

The International Surgical Society (Société Internationale de Chirurgie) will meet in New Orleans, October 10th to 15th inclusive. It is one of the oldest of the international medical societies, having been founded in 1902. Distinguished presidents include such famous American surgeons as Matas and Keen, and others from abroad as Kocher, Depage and Czerney.

A large attendance, including representatives from many foreign countries, is expected. The proceedings will be in their respective languages. The headquarters will be the Roosevelt Hotel.

#### WOMAN'S AUXILIARY TO THE LOUISIANA ACADEMY OF GENERAL PRACTICE

Announcement of officers elected at the recent convention, confirmation of councillors to promote membership in the various districts, and appointment of chairmen of standing committees, comprise the highlights of activity in the Woman's Auxiliary to the Louisiana Academy of General Practice.

Mrs. D. B. Barber, of Pineville, La., will guide the affairs of the women as president of the group this year, while her husband assumes a similar position, heading the men's association. Mrs. George D. Feldner of New Orleans is president-elect, Mrs. John W. Atkinson of Gretna, vice-president, Mrs. Frank H. Davis of Lafayette, recording secretary, Mrs. N. M. Brian of Alexandria, corresponding secretary, Mrs. Esmond A. Fatter of New Orleans, treasurer, and Mrs. Daniel J. Murphy of New Orleans, parliamentarian.

Chairmen of standing committees include Mrs. J. A. White, Jr., of Alexandria, in charge of Social Relations, Mrs. John W. Atkinson of Gretna, to promote membership; Mrs. Charles Horton of Franklin as historian, and Mrs. Edwin R. Guidry of New Orleans, in charge of publicity.

Councillors are: First District, Mrs. Nicholas J. Chetta and Mrs. Bruno Mancuso of New Orleans; Second District, Mrs. Earl J. Clayton of Norco; Third District, Mrs. W. A. K. Seale of Sulphur, La.; Fourth District, Mrs. J. M. Bodenheimer, Shreveport, La.; Fifth District, Mrs. John Bostic, Gilbert; Sixth District, Mrs. Thomas Y. Gladney, Baton Rouge; Seventh District, Mrs. E. Rigsby Hargrove, Oakdale, and Eighth District, Mrs. C. P. Herrington, Alexandria.

The Advisory Board consists of Dr. Joel B. Gray, New Orleans, Dr. J. P. Sanders, Shreveport, Dr. Janie M. Topp, Lake Charles, Dr. C. P. Herrington, Alexandria, and Dr. E. Rigsby Hargrove of Oakdale.

Plans being formulated for the organization of a national group at the convention meeting scheduled at St. Louis for February 22, 23 and 24, will be announced next month.

Mazie Adkins Guidry,  
Chairman of Publicity.



## BOOK REVIEWS

*Synopsis of Neuropsychiatry:* By Lowell S. Selling, M. D., Ph. D., Dr. P. H., F. A. C. P. 2d Edition. St. Louis, C. V. Mosby Co., 1947, pp. 56, illus. Price, \$6.50.

This book is excellent insofar as it covers every clinical condition that might be encountered in neurology and psychiatry. The handling of controversial questions is done with reasonableness and according to generally accepted opinions.

However for the student who wants to understand theory and dynamics, this synopsis would be disappointing. No subject is clarified except at a clinical descriptive level. On that level it is comprehensive and detailed.

WALKER THOMPSON, M. D.

*Text-Book of Public Health:* By W. M. Frazer, O. B. E., M. D., Ch. B., M. Sc. D. P. H., and C. O. Stallybrass, M. D., Ch. B., D. P. H., M. R. C. S., L. R. C. P. 12th ed., Baltimore, The Williams and Wilkins Co., 1948, pp. 571, illus. Price, \$6.50.

This twelfth edition of the *Text-Book of Public Health* (formerly Hope and Stallybrass), only two years after the eleventh edition, is occasioned, in the authors' own words "by the increase in the number of medical students and to the resumption of D. P. H. courses, discontinued during the war." There is consequently little change in those chapters dealing with purely technical subjects. There is considerable change in those chapters dealing with administration because of the great amount of health legislation passed by the British Parliament in 1945 and 1946. These years saw the passage of the National Health Service Act, the Family Allowances Act, the National Insurance (Industrial Injuries) Act, and the National Insurance Act.

This textbook, as mentioned above, is designed for medical students and students of Public Health in Great Britain. Therefore, the policies and practices defined and discussed are those in effect in the British Isles. There is a great deal of basic information on physical subjects and environmental sanitation in relatively simple terms which students in the United States will find of interest and benefit. However, the textbook will be of most interest to the student of Public Health who will find here detailed discussions on powers and duties of the British Public Health system.

Factual data used throughout the book appear to be up to date though some of the clinical procedures described are no longer in use in this country. Terminology and brand names or trade names, where used, will not be familiar to readers in this country. With this in mind, however, the student will find much of value in the book.

WALDO L. TREUTING, M. D., M. P. H.

*Recent Advances in Obstetrics and Gynecology:* By Aleck W. Bourne, M. A., M. B., B. Ch., F. R. C. S., F. R. C. O. G., and Leslie H. Williams, M. D., M. S., F. R. C. S., F. R. C. O. G. 7th ed., Philadelphia, The Blakiston Co., 1948, pp. 326, illus. Price, \$6.00.

The seventh edition of *Recent Advances in Obstetrics and Gynecology*, by Aleck W. Bourne, and Leslie H. Williams, contains six new chapters replacing the same number of chapters from the sixth edition. The chapters retained have been modified in accordance with more recent knowledge.

Part one deals with the following subjects in obstetrics: Nutrition in pregnancy and fetal development, weight changes and water retention. The chapter on anemias of pregnancy is a new addition and is a very excellent work. Chapters on anesthesia and analgesia in obstetrics, penicillin in obstetrics, lactation, vitamin K and hemorrhagic disease of the new-born, erythroblastosis, stillbirth and neonatal death, and radiology in obstetrics, have been thoroughly revised and modified according to recent advances.

Part two deals with the following subjects in gynecology: Cancer of the cervix uteri, stress incontinence, sympathectomy, penicillin in gynecology, radiological investigation and diagnosis, and x-ray therapy in gynecology.

All in all, the book is very comprehensive and well written.

ADOLPH JACOBS, M. D.

*Brief History of the South Carolina Medical Association:* Published by the South Carolina Medical Association, Charleston, 1948. Port., pl., illus., pp. 197.

Latest of the state histories of medicine is this brief but inclusive medical history of South Carolina. Beginning with a sketch of medicine in Colonial South Carolina, the earliest medical societies and institutions are described, followed by the development of state health activities, the growth of hospitals and medical publications, and the medical problems of today and the future. History of county societies is given in brief, as are short accounts of the establishment of specialty societies in the state and South Carolina's medical institutions. This volume will serve a very useful purpose as a contribution to the medical history of the South.

MARY LOUISE MARSHALL.

*Take Up Thy Bed and Walk:* By David Hinshaw. New York, G. P. Putnam's Sons, 1948. Pp. 262, illus. Price, \$2.75.

This is the story of the Institute for the Crippled and Disabled in New York. It is particularly interesting in that it shows the results which may

be obtained by cooperative effort of all agencies having to do with rehabilitation—medical, physical, psychological, social and vocational. This Institute has helped some 25,000 physically handicapped men, women and children to find new reason for living.

MARY LOUISE MARSHALL.

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*Atlas of Peripheral Nerve Injuries:* By William R. Lyons, Ph. D., and Barnes Woodhall, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp. 339, plates. Price, \$16.00.

This atlas is a monumental contribution to the knowledge and records concerning peripheral nerve injuries. The work is principally based on observations made at Walter Reed General Hospital and Halloran General Hospital on patients who sustained peripheral nerve injuries in World War II. A description of the clinical material used and the methods of fixing nerve tissue, is followed by a section devoted to normal peripheral nerve structure. Then there are sections showing the findings in the instance of completely severed nerves and nerve lesions in continuity. The many aspects of nerve suture, including time factors, reactions to suture materials and wrappers, and suture site neuromas are illustrated and described. The results of various types of nerve grafting are demonstrated and critically analyzed. Most of the illustrations, are in the form of excellent photomicrographs both black and white and colored. Clinical photographs both black and white and colored, preoperative, operative, and postoperative findings. Altogether, this publication is a masterpiece which will do lasting honor to everyone who had a part in its preparation.

AMBROSE H. STORCK, M. D.

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*The Fundamentals of Pulmonary Tuberculosis and Its Complications:* By Edward W. Hayes, Editor. Springfield, Ill., C. C. Thomas, 1949. Pp. 464. Price, \$9.50.

This book was sponsored by the American College of Chest Physicians as a textbook on the subject of pulmonary tuberculosis for the use of medical students, teachers, and practicing physicians. The editor and the various authors have gone far toward filling the real need for such a text. Although it is possible that one author could have written a more integrated volume of this size, the point of view of the writer of each chapter is

of interest and value. The reader should realize, however, that some of the views expressed are peculiar to the individual authors and not always "opinions held by large groups of experienced observers," as stated in the introduction. For example, the favorable mention of Caulfield's inhibition reaction (no reference given) as a means of detecting tuberculosis will only serve to confuse the student, since this test has not been found of any value in the 24 years since its announcement. The bibliographies appended to the chapters are not edited either to avoid duplication or to remove references to outdated and unimportant methods. The compilation of books on the various phases of pulmonary tuberculosis at the end of the volume is an admirable feature. The illustrations of many of the chapters are excellent, but a more equal distribution of illustrated material would have been desirable. The format and typography are of the usual excellent quality provided by this publisher.

The book is recommended, with the above reservations, as a textbook for medical students and practitioners.

J. L. WILSON, M. D.

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*Nutrition and Diet in Health and Disease:* By James S. McLester, M. D. 5th ed., Philadelphia, W. B. Saunders Co., 1949. Pp. 800. Price, \$9.00.

There is a trite observation that there is no evil but that some good may be found in it. This has been evidenced by the many important medical observations and discoveries which have resulted from experience in World War II. This has in the main been responsible for the new and fifth edition of McLester's book on nutrition and diet in health and disease.

The newer concepts of treatment in important diseases, as peptic ulcer, cirrhosis, congenital heart failure, etc., have resulted in revised presentations.

Several chapters by collaborators have been entirely rewritten. Appended to each chapter is a good bibliography.

I. L. ROBBINS, M. D.

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*Mayo Clinic Diet Manual:* By The Committee on Dietetics of the Mayo Clinic, Philadelphia, W. B. Saunders Co., 1949, pp. 329. Price, \$4.00.

This has been done in the thorough and excellent manner characteristic of all work done at the Mayo.



Clinic. Diets in health and disease are outlined, and the *raison d'être* and *modus operandi* are briefly mentioned. Casual sampling gives the impression that this is a worthwhile addition to all ordering and executing the diet of the well and the ill.

I. L. ROBBINS, M. D.

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PUBLICATIONS RECEIVED

Duke University Press, Durham: The Compleat

Pediatrician (Sixth Edition), by W. C. Davison, M.A., D. Sc., LL.D., M.D.

J. B. Lippincott Company, Philadelphia: New and Nonofficial Remedies—1949, issued under the direction and supervision of the Council on Pharmacy and Chemistry of the American Medical Association.

Charles C. Thomas, Springfield, Ill.; Neurology (4th Ed.), by Roy R. Grinker, M.D. and Paul C. Bucy, M.D.

# New Orleans Medical

and

## Surgical Journal

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### THE MANAGEMENT OF ACUTE HEAD INJURIES\*

DEAN H. ECHOLS, M. D.†  
NEW ORLEANS

In a symposium on trauma the discussor of acute head injuries can comment only briefly on each of the more important aspects of the problem. For convenience, the general measures applicable to all cases will be outlined first, and this will be followed by a discussion of the specific treatment of the common types of head injury.

#### GENERAL MEASURES APPLICABLE TO ALL CASES

1. *First Aid:* Practically speaking, there are no first aid measures applicable to patients with head injury other than the application of an elastic pressure bandage to scalp wounds before transportation of the patient to the nearest hospital or physician's office. However, many patients require first aid treatment for associated injuries, such as fracture of the cervical spine or long bones. Such patients should not be given morphine unless they are in extreme pain.

2. *Treatment of Shock:* Traumatic shock is rare in patients whose injury is limited to the head. If it occurs, it should, of course, be combatted by the administration of blood or plasma. Unless the state of

shock is alarming, the injured head should not be lowered below the level of the heart. There is rarely need for immediate suture of the scalp or debridement of compound fractures. Surgical treatment can be deferred twelve or more hours for stabilization of the patient's condition unless there are signs of deterioration due to intracranial bleeding.

3. *History Taking:* Just before or while examining the patient the physician should inquire as to the exact hour of the accident. It is important to find out if the patient became unconscious at the moment of the impact or whether unconsciousness developed minutes or hours later. Often, a fair estimate can be made of the degree of cerebral damage if all details of the accident are known. An interval of consciousness between the primary and secondary attacks of coma usually indicates active bleeding from the middle meningeal artery.

4. *Examination:* Because the unconscious patient with cerebral trauma may also have other serious injuries, such as a ruptured spleen requiring emergency surgical intervention, the preliminary examination should be primarily concerned with a brief search for other injuries. Following this, painful stimuli should be applied to unconscious patients to demonstrate the presence of weakness or paralysis of the facial muscles and extremities, as well as to estimate depth of the coma. The temperature, pulse rate, blood pressure, and character and rate of respiration should be determined. The state of the pupils is important. Ears and nose should be inspected for blood and cere-

\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 6, 1949.

†From the Section on Neurosurgery, Ochsner Clinic and the Department of Surgery, Tulane University of Louisiana, School of Medicine, New Orleans.



brospinal fluid. Special attention should be given to palpation of the skull and investigation of scalp wounds.

5. *Continuous Observation of Patient:* Since the exact diagnosis in a head injury is never known within the first few days, continuous observation of the patient is absolutely essential. Special nursing care and frequent examinations by the physician are imperative. Change in the character of respiration, rise in blood pressure, increase in temperature above 101° F., fall in pulse rate below 60 beats per minute, development of hemiparesis, deepening of unconsciousness, and dilatation of a pupil must not go uncharted. The patient who becomes less comatose with the passage of time probably does not have a surgical lesion and most likely will survive. Conversely, the patient whose coma becomes progressively deeper presumably has an intracranial hematoma requiring surgical treatment.

6. *Making of Roentgenograms:* It is customary to make stereoscopic roentgenograms of the skull, and often of the neck, shortly after the patient's arrival in the hospital. However, these should not be taken until the physical examination has been done and treatment for shock, if present, has been completed. Patients in poor condition should not be taken to the roentgenologic department until their condition has improved or a decision has been made to operate.

7. *Spinal Puncture:* It is generally considered preferable to omit spinal puncture at the time of the initial examination in patients with acute head injury. Study of the spinal fluid and measurement of the cerebrospinal fluid pressure during the first few hours almost never provides information of therapeutic value. Furthermore, removal of fluid in any patient who has an intracranial hematoma is obviously dangerous. Spinal puncture on the second or third day is sometimes performed for the relief of headache or for the discovery of specific information. For example, is stiffness of the neck due to vertebral injury, subarachnoid hemorrhage, or menin-

gitis? Also, spinal drainage every twelve hours is indicated for cerebrospinal rhinorrhea. It is now generally known that the spinal fluid pressure is normal or subnormal in most patients with cerebral injury in the absence of gross hemorrhage.

8. *Maintenance of Fluid Balance:* Treatment of the unconscious patient with severe brain injury by hypertonic solutions intravenously, magnesium sulphate orally or rectally, and strict limitation of fluid intake has become obsolete. The intravenous administration of concentrated serum albumin, concentrated plasma, or 50 per cent solution of dextrose should be reserved for patients with definite evidence of high intracranial pressure due to hemorrhage or anoxia. In recent years it has been well established that head injury causes little cerebral edema and little if any increase in intracranial pressure. The chief causes of cerebral swelling are anoxia of the blood and intracranial hemorrhage. It is advisable to give an adult from 1500 cc. to 1800 cc. of fluid daily. In the beginning 800 cc. of a 5 per cent solution of dextrose in distilled water and 1000 cc. of sodium chloride in a 5 per cent solution of glucose can be given intravenously. Patients unconscious for more than twenty-four hours should receive food and fluid by gastric tube. If patients are receiving sulfonamides, the daily fluid intake should be at least 2000 cc., regardless of the state of consciousness. A more physiologic approach is to maintain the urinary output at 1000 cc. every twenty-four hours regardless of the fluid intake required.

9. *Management of Urinary Incontinence or Retention:* Unconscious patients who do not void or who are incontinent require indwelling catheterization.

10. *Administration of Sedatives:* Restless, noisy, struggling patients need sedation for at least part of each twenty-four hours but it is wise to withhold such medication until a diagnosis has been made and definitive treatment started. Morphine is to be avoided in patients with head injury except under special circumstances. Sodium phenobarbital or sodium amytal, either

intramuscularly or intravenously, can be given until the desired effect has been obtained. Codeine satisfactorily relieves pain in conscious patients.

11. *Control of Convulsions*: Convulsions in patients with acute head injuries fortunately are uncommon. If several occur within a short time, an adult patient should receive 3 to 5 gr. of sodium phenobarbital intramuscularly. If this does not control the seizures, repeated doses of 3 gr. of sodium phenobarbital should be given intramuscularly or intravenously until the seizures have ceased. Dilantin sodium, 6 gr., should be given by mouth simultaneously and each day thereafter for several days or weeks. One must be fully aware that convulsions, particularly Jacksonian convulsions, may be an early sign of an extradural, subdural, or subcortical clot.

12. *Treatment of Respiratory Difficulties*: Fall of the respiratory rate below 14 per minute, rise above 35, periods of apnea, labored respiration and "moist" respiration are grave prognostic signs in patients with cerebral injuries. If a patient's color or breathing is not perfect, he should receive oxygen by nasal tube at the rate of 6 liters a minute. If partial obstruction of the pharynx or trachea by the tongue or by secretions cannot quickly be remedied by a rubber airway, endotracheal suction, or postural drainage, tracheotomy should be performed. Probably 20 per cent of patients with severe cerebral injuries should have a tracheotomy. The response of these patients to tracheotomy is invariably spectacular. It seems safe to state that maintenance of a wide open and dry tracheobronchial tree is the most important single factor in the treatment of severe injuries of the brain. Cerebral edema is caused by anoxia of the blood, not by cerebral damage.

13. *Use of Antibiotics and Sulfonamides*: In compound fractures of the skull, of any type, the patient should receive sulfadiazine by mouth, and penicillin intramuscularly, for ten days. Doses of 10,000 units of penicillin can be safely applied locally in solution after debridement of wounds of

the scalp or brain, but the local use of sulfonamides is to be avoided.

14. *Control of Fever*: Rising temperature during the first twelve hours in patients with acute cranial injuries indicates damage to the brain stem or irritation from blood in the ventricles and subarachnoid space and is a bad prognostic sign. Some patients die of hyperthermia. Treatment consists of applying enough ice bags, alcohol rubs, and electric fans to keep the rectal temperature at or below 101° F.

15. *Avoidance of Bed Rest*: Patients with any type of head injury, whether surgical or nonsurgical, should be encouraged to sit in a chair and walk as soon as they seem physically able to do so. Maximum reassurance and even apparent indifference to symptoms on the part of the physician in charge is indicated during the convalescent period if post-traumatic psychoneurosis is to be kept in its mildest form.

#### SPECIFIC TREATMENT OF THE COMMON TYPES OF HEAD INJURY

1. *Cerebral Concussion*: For practical purposes, a diagnosis of simple cerebral concussion is made if the patient regains consciousness within fifteen minutes. Longer periods of unconsciousness indicate that there has also been contusion of the brain. No special treatment is indicated for concussion but close observation of the patient for eighteen hours is essential because of the remote possibility of bleeding from a ruptured middle meningeal artery. It might be pointed out here that the long-standing theory that there are no microscopic changes in the brain after concussion has been abandoned. Windle, Groat and Fox<sup>1</sup> have shown that in animals with concussion certain microscopic changes in brain cells can be demonstrated after a lapse of two to eight days. This structural basis for the symptoms of concussion has been accepted by Denny-Brown<sup>2</sup> and other authorities.

2. *Simple Linear Fracture of Skull*: Linear fractures of the skull can occur with or without loss of consciousness. The diagnosis is made by roentgenography. Gener-



ally speaking, no treatment is required unless the fracture causes a tear of the middle meningeal artery. A linear fracture which extends into a paranasal sinus is actually a compound fracture of the skull and should be treated accordingly.

3. *Simple Depressed Fractures of Skull:* Most simple, depressed fractures of the skull are incapable of exerting continued pressure on the underlying brain and require no treatment. Patients with severely depressed fractures should be transferred to a neurosurgeon several days following the accident after the immediate effects of the injury have subsided. Excision of the depressed fragments and repair of the defect with a tantalum plate is the treatment of choice, although occasionally the depressed fragments can be restored to their normal position.

4. *Lacerations of the Scalp:* Lacerations of the scalp should be sutured immediately or, if more convenient, six to twelve hours later. Shaving the scalp about the laceration and thoroughly cleansing the wound with soap and water are essential. Sulfonamides should not be placed in such wounds. Closure without drainage is accomplished with interrupted sutures of cotton or silk. Subcutaneous sutures are to be avoided in most instances. The application of a pressure bandage in extensive lacerations will prevent the formation of a hematoma under the scalp.

5. *Compound Linear Fractures of the Skull:* If roentgenograms show that a linear fracture extends into a paranasal sinus, or if a linear fracture of the skull is noted during repair of a laceration of the scalp, the patient should receive an intramuscular injection of 30,000 units of penicillin. Additional penicillin intramuscularly, and sulfadiazine orally, should be administered for ten days as prophylaxis against infection. Debridement of the fracture line is not indicated.

6. *Extradural Hematoma:* Every patient who sustains a major or minor injury of the head should be suspected of having an extradural hematoma until the passage of time convinces the observer of the contrary.

This means that the patient must be watched closely for eighteen hours. The patient should not be left alone. The pulse and respiratory rates should be checked every fifteen minutes. A sleeping patient should be aroused at least every hour to make certain that he has not slipped into coma. When bradycardia, slow respiration, vomiting, deepening coma, inequality of pupils, Jacksonian seizures, or hemiparesis call attention to bleeding from a torn middle meningeal artery, a large opening must be made in the temporal bone as quickly as possible. There is not time to send the patient to a neurosurgeon. Blood transfusions are needed.

7. *Compound Depressed Fractures of the Skull and Penetrating Wounds of the Brain:* Patients with these types of injuries should receive penicillin and streptomycin and be transferred to a hospital where a neurosurgeon is available. These patients tolerate ambulance and air travel. Twenty-four hours is early enough for surgical treatment in most cases. The anesthetic of choice is procaine infiltration with or without sodium pentothal intravenously. If these are not suitable, the endotracheal administration of ether is indicated. A perfect airway is essential at all times and one should not hesitate to employ endotracheal intubation or to perform tracheotomy. The treatment consists of debridement of the scalp, skull and brain, absolute hemostasis, perhaps the local application of a solution of 10,000 units of penicillin, and closure of the dura. If part of the dura has been destroyed, the defect is repaired with periosteum, temporal fascia, or synthetic membrane. The importance of dural closure and scalp closure without tension cannot be overestimated. Attention should be called to the occasional great usefulness of gelfoam and thrombin in the control of bleeding from cortical vessels.

The traumatic surgeon must be aware of the possibility of an intracerebral hematoma or a subdural hematoma at the point of exit of a missile. It is well to excise the wound of exit in the scalp and debride the skull and meninges in most cases.

8. *Cerebrospinal Rhinorrhea*: The escape of spinal fluid from the ear in a basal fracture of the skull almost invariably stops spontaneously within a day or two but cerebrospinal rhinorrhea is a more serious problem. Antibiotics, sulfadiazine, and spinal drainage every twelve hours, usually solve the problem within a few days. If the fistula persists for a week, in spite of spinal drainage, the tear in the dura should be repaired through a frontal osteoplastic craniotomy. Roentgenograms should be repeated in cases of cerebrospinal rhinorrhea to determine whether or not air has entered the subarachnoid space and ventricles.

9. *Severe Brain Injury Without Compound Fracture of Skull*: The majority of serious head injuries fall within this category. Surgical treatment is not indicated unless an extradural, subdural, or intracerebral hematoma is suspected and demonstrated by trephination, arteriography, or ventriculography. Patients may make a remarkably satisfactory recovery after several weeks of unconsciousness but during this period there must be special nursing care, intranasal administration of oxygen, adequate food and fluids by gastric tube, indwelling catheterization, measurement of urinary output, aspiration of tracheobronchial tree, often tracheotomy, administration of sulfonamides and antibiotics, frequent change of position, control of fever, and prevention of extreme restlessness or convulsions.

10. *Acute Subdural Hematoma*: This is not a clinical entity. Often a collection of arterial or venous blood is found in the subdural or subarachnoid space or both during surgical operations for compound fractures of the skull. The associated laceration or penetrating wound of the brain is usually of greater importance than the hematoma.

11. *Subdural Hygroma*: In this relatively rare lesion, a small tear in the arachnoid permits cerebrospinal fluid to enter the potential subdural space where it becomes trapped. Since there is no absorptive mechanism in the subdural space, the patient has signs and symptoms of increasing

intracranial pressure. If the collection of subdural fluid becomes sufficiently large, all the signs and symptoms of subdural hematoma may appear. Prompt recovery follows trephination and evacuation of the fluid through an opening in the dura.

12. *Intracerebral Hematoma*: Occasionally trauma, as well as apoplexy, causes a hematoma to form within the substance of the brain. This gives rise, rather rapidly, to the same signs and symptoms that a tumor in the same location would be expected to produce. After localization of such a clot by clinical methods, arteriography or pneumoencephalography, it can usually be removed through a 3 cm. trephine.

13. *Chronic Subdural Hematoma*: Chronic subdural hematoma is a late complication of a blow to the head and does not usually manifest itself until weeks or months after injury. The treatment is complete or partial removal of the lesion through an osteoplastic flap or through one or more trephines.

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### EARLY MANAGEMENT OF INJURIES OF THE CHEST\*

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AND

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SHREVEPORT

The purpose of this paper is to discuss the newer as well as the older first aid measures in lifesaving in injuries of the chest. Injuries of the chest are often very serious emergencies. The heart and lungs receive injuries with less physiological quietude than almost any other part of the body. An analysis of 11,000,000 English, French, American, and German wounded

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revealed only 6 per cent had chest wounds, but of the total mortality of 8 per hundred, 56 per cent died from chest wounds.<sup>1</sup> The patient with a chest wound has the same shock, hemorrhage, and sepsis as those with wounds elsewhere in the body, and, in addition, he may have interference with heart and lung action. He may have compression of the lung, or lungs, with blood or air in the chest cavity. He may have a sucking wound or open pneumothorax. He may have pressure on the heart from excessive blood or air in the chest, or blood in the pericardial sac itself. Early relief of these physiological grievances is often lifesaving. It is not the work of the specialist but of the quick thinking, informed family doctor at the time of accident that saves the greatest number of lives.

Close inspection and timely observations of the patient are needed before planning the treatment. Wrong treatment is often worse than no treatment at all. Are the patient's finger nails blue? Is he cold and clammy, or is he warm and moist? Is his pulse full and bounding, or is it thin and thready? When did he get hurt? Do both sides of his chest move equally? Where is the heart beat? Is he spitting or coughing up blood? Does he wheeze? Is his wound sucking air? All of these simple things are the guide posts to treatment.

The "firsts" in treatment are directed towards saving life. If he is blue give him oxygen—yes, from the welder's oxygen tank if no other is immediately available. If he is in shock give him fluids as well as oxygen. Any sterile carbohydrate or plasma solution is good until whole blood can be obtained. Put his head lower than his body and keep him warm. These were and still are good procedures to save life. Once these first aid measures are done check his chest for movement. If one side of his chest does not move, then he has either fractured ribs, or air or blood in his chest. Percuss it. If flat, it is blood, and if resonant, it is air. If resonant, he may have a pneumothorax or he may have fractured ribs limiting the chest action. Listen for breath sounds. If they are absent it is a

pneumothorax. Note the location of the heart beat. If it is out of place or he has a weak pulse pressure, and the neck veins bulge, he has serious impairment to the return blood supply to the heart. If his pressure is low he has either a shift of the mediastinum or fluid in the pericardial sac. A decision between the two is made from the nature of the injury and the pulse pressure. If there is a mediastinal shift, take off air or fluid by thoracentesis. If there is continued leaking of air and evidence of mediastinal shift recurs, insert a blunted large needle or install an intercostal rubber catheter in the fifth rib interspace in the mid-axillary line and attach it to a water bottle trap on the floor. This will promote gradual re-expansion of the lung. If blood is found and the injury is only a few hours old, replace half of the blood removed with air. If a large pulmonary vessel is injured he may start bleeding again. Autotransfusion may be used when it is expedient. Injuries to the intercostal vessels in penetrating wounds of the chest are much less common than injuries to the pulmonary vessels themselves. The lung tends to control intrapulmonary bleeding itself, if not re-expanded too vigorously and too early. If pericardial fluid is found a pericardial aspiration may need to be done.

If the patient has obstruction in the throat or trachea get a clear airway. A blow with the palm of the hand on the sides of the chest will often clear a larynx of obstruction. An ordinary urethral catheter attached to the office nasal suction apparatus can be used harmlessly, and often as effectively as the bronchoscope. Pull the patient's tongue forward with a cotton sponge and insert the catheter through the nose so that the tip is in the posterior pharynx. When he inhales plunge the catheter. It may not go into his trachea the first try, but it will the second or third attempt. Suck the trachea dry. The catheter will not only clear the trachea but will stimulate coughing and thus help to clear his bronchial tubes as well.

Fractured ribs are probably the most common chest injury. A simple fracture

of one is of only painful moment. A compound fracture may be lethal. You do not need a modern x-ray apparatus, just listen to the chest with an old fashioned stethoscope. If no breath sounds are heard it is more serious. Unless the patient is a very fat person check his ribs with your "doctor's" fingers. If he is conscious, press the ribs near the vertebral column and have him indicate the point of pain. The fracture is there where he indicates. Many older text books and doctors advocate strapping the chest with adhesive tape in rib fractures. This has some danger. It is better not to do it. Lacerations of a sound lung may result just from the pressure, and enough interference with breathing may be produced to promote atelectasis and its sequel pneumonia. Who has not observed pneumonia in rib fracture cases— A safer and more pain allaying method is to inject the tissues around the fracture site with novocain. One injection may well stop the spasm and pain for many hours. Re-inject if necessary.<sup>2</sup>

If there is a compound fracture from a penetrating wound and there is sucking of air, treat the sucking wound by a compression dressing.<sup>3</sup> Later treat the fracture. It may require the training and skill of the chest surgeon, particularly if there is marked injury to the intercostal vessels or lung. Multiple fractures of ribs some times require considerable surgery and much care postoperatively. If subcutaneous or body cavity emphysema is present give oxygen at 10 to 14 liters per minute. Use a nasal catheter or a Boothby-Sandiford mask. Stop the oxygen in two hours. Then two hours later start it again. Marked relief will be noticed. One or two such treatments are often sufficient. This is a lifesaving measure in severe mediastinal emphysema.

Chemical injuries may be grouped in three classes: dust particles, gases and oils. Pneumoconiosis is not a surgical problem. Gases may be. In mild cases fresh air is good treatment. Nasal or mask oxygen may be used in the more severe cases. If the patient is comatose then artificial respiration must be used with the above. Oils

may require specific treatment. In rural areas the accidental aspiration of kerosene is common and tractor fuel tanks frequently contribute to the tractor operators getting fuel into their tracheas. Early treatment is supportive. If any large amount is present then postural drainage and aspiration with a catheter are indicated. Aminophyllin may help dilate edematously obstructed bronchi. Bronchoscopy with direct application of adrenalin to edematous bronchial mucosa may be necessary. Chemotherapy should be instituted to prevent pneumonia.

Missiles that penetrate the chest and abdominal cavities simultaneously may injure the liver. When shock exists, treat it by the usual supportive methods. When shock has been controlled the patient should be moved to a surgical hospital. If he has both a chest bleeding wound and an abdominal bleeding wound then all available facilities will be needed at operation. The blood bank and the specialists will then both need to be on hand.

Injuries to the brachial plexus and brachial blood vessels are occasionally observed in gunshot wounds of the chest. Any palsy of the arms or hands is significant. Call it to the attention of the patient and bystanders before surgical treatment. Brachial blood vessels and subclavian vessels when injured often develop aneurysms. These as well as nerve injuries may be treated surgically at a later date. Some of them do not require any treatment at all other than "time."

Artificial respiration should be given with deliberation and caution. Many respirators produce too high a pressure for the lungs. Actual rupture of the lung parenchyma has been produced by such instruments. Mediastinal emphysema has been produced resulting in marked pressure on the vena cava and death.<sup>4</sup> No pressure over 20 cm. of water should ever be used.<sup>5</sup> In the presence of fractured ribs manual artificial respiration should be done with great caution or not at all. Actual puncture of the lung has been done by manual artificial respiration in the presence of frac-



tured ribs. Oxygen mask apparatus is to be preferred whenever available.

Important secondary measures after immediate lifesaving procedures have been instituted are chemotherapeutic administrations. Either 300,000 units of penicillin or 1 gram of streptomycin or both should be given parenterally within a few hours after the injury. Infection in chest wounds may be extremely serious. If the skin is broken antitetanic serum should be given. External dressings of furacin soluble dressing have proved extremely effective in combating infection in external abrasions and lacerations.

#### CONCLUSIONS

1. Injuries of the chest generally require earlier well directed systematic first aid treatment than wounds elsewhere in the body.

2. Consideration for cardiac and respiratory function must be foremost in planning first aid treatment.

3. Careful inspection of the chest action is important in planning early management.

4. Treat the shock first.

5. Artificial respiration should be given with great caution.

6. Chemotherapeutic agents should be given all chest injuries early.

7. Definitive surgical treatment is best done in a hospital where there is a blood bank and a staff of experienced surgeons conversant with the chest.

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## NONPENETRATING INJURIES OF THE ABDOMEN

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NEW ORLEANS

Serious injuries of abdominal viscera resulting from forces that do not penetrate or perforate the abdominal wall are not common. Yet it seems proper to consider these injuries at this time, because the majority of them are acquired in vehicular accidents. We may expect more accidents during the summer months than during the winter months. Because of infrequency of occurrence, lack of identifying early symptoms, apparent rapid recovery from severe trauma, disastrous effects from what seems to be mild injury, the prognosis is grave and the mortality exceedingly high. In at least 25 per cent of our series and that of Rowlands<sup>1</sup> there were other injuries that made the abdominal injuries more difficult to diagnose and added to the gravity of the prognosis.

#### CLASSIFICATION OF THE TRAUMATIC FORCE

The types of forces that cause injury of abdominal viscera without cutting or perforating the wall are classified into three groups<sup>2</sup>: (1) compression; (2) traction; (3) disruption.

*Compression force* can be subdivided into sharp, such as a blow, and gradual. These may be local or general. Usually the injuring force compresses the organ against the spinal column. Such a force is capable of causing injury to both solid and hollow viscera and may drive fragments of ribs or pelvic bones into viscera.

*Traction force* causes injury at or near the junction of fixed and mobile portions of the viscera. Tearing occurs when the

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mobile portion is suddenly arrested by the fixed portion. Veal<sup>3</sup> attributed the mesenteric border tears he encountered to this mechanism. The mesenteries, the duodenojejunal junction, and the ileocecal junction are fixed portions of the intestinal tract.

*Disruption force* is exerted against the inner walls of hollow viscera, causing the wall to give way. Areas weakened by diseases or previous injuries are more prone to burst than normal wall. Enemata given with too much hydrostatic pressure or given directly from water taps, are common sources of injury. Compression forces applied over hollow viscera in a state of distention will cause pressure with bursting: examples are the stomach shortly after a meal, the bladder distended with urine and the pregnant uterus.

#### CLINICAL CLASSIFICATION

Estes<sup>4</sup> classifies nonpenetrating trauma of the abdomen into three groups: (1) severe multiple injuries which are rapidly fatal and for which no treatment is of avail; (2) injuries that obviously require immediate operation; (3) cases in which the diagnosis is doubtful and the indications for or against operation are not clear. Most of the patients will be in group 3.

In analyzing fifty-five cases we have found it simpler to classify them according to the nature of the accident into five categories, namely: (1) blows; (2) falls; (3) vehicular accidents; (4) compression injuries; and (5) disruptions. It is obvious that motor vehicle accidents include 1, 2, 4, and 5. Clinically we have divided them into injuries of solid organs, injuries of hollow viscera, injuries of the diaphragm, and retroperitoneal hematomata of undetermined origin.

Fifty-four records reviewed in the paper were taken from the Charity Hospital at New Orleans. One, through the courtesy of Dr. F. L. Cato, was taken from the files of Touro Infirmary. Included in this series are 14 reported by Dr. Isidore Cohn.<sup>5</sup> His commendation of the resident staffs of the three divisions of Charity Hospital is further justified by our study of the additional cases.

Five patients who were injured during the process of birth are included because they showed compression injuries of abdominal viscera. It can be stated that the mildness of the abdominal injuries found at autopsy indicated that they played no part in the death of 3. Two additional cases were included because of compression injuries acquired during the administration of artificial respiration. We have reasons to believe that both of these patients were dead from anoxia before the injuries occurred. All of the injuries occurred during the period from December 31, 1942 to January 1, 1949.

*Incidence.* There were 484,004 traumatic cases seen in the Accident Room of Charity Hospital during this same interval of time. The percentage incidence of nonpenetrating wounds of the abdomen was the very low 0.011 per cent.

*Sex.* There were 44 males (80 per cent) and 11 (20 per cent) females. This is not unusual, for males predominate in most of the reported series.

*Age.* All age groups are represented in this series, from the newborn to 80 years. Nearly one-half of the injuries occurred during the first two decades of life and over two-thirds during the first four decades. Four individuals over 70 received serious nonpenetrating abdominal injuries.

*Cause of injury.* Motor vehicles played the most important role in causing injury. Of the 55 accidents 26 were caused by them; therefore, nearly one-half can be classed as road casualties. Blows to the lower chest and abdomen accounted for 11 while falls were responsible for 10 injuries. An infant five days old suffered a rupture of the cecum during the administration of an enema. One patient getting artificial respiration received a rupture of the stomach when pressure was applied over that organ while it was distended with anesthetic gases. The other, a poliomyelitis victim with many episodes of respiratory failure, sustained a rupture of the diaphragm while in the respirator.

*Time intervals.* The average time between acquiring the injury and admission



to the hospital was 13.3 hours. This average is high because in 9 patients concerned they did not seek admission to the hospital until fourteen to ninety-six hours had elapsed. In all 9, the patients were not considered seriously ill during that period. These patients illustrate the necessity for close and constant observation of those who receive blunt trauma to the abdomen.

The average time elapsing between receipt of the injury and operation was 32.3 hours. Besides the late admissions in some cases, other causes for delaying operative treatment were: (1) severe injuries of other parts of the body, especially fractures of the skull, the extremities, and the lower ribs; and (2) mildness of early abdominal symptoms, and the tardy appearance of important symptoms and signs in many. In 2 evidence of the seriousness of the injuries did not become manifest until six and ten days. The first was discharged from a hospital after being observed for twenty-four hours; the second was hospitalized during the entire period because of other injuries.

*Mortality.* If 5 patients, (3 premature infants and 2 respiratory deaths) are excluded, the mortality for the remaining fifty cases is 42 per cent. Thirty-six patients had abdominal explorations with a mortality rate of 22 per cent. Fourteen were not operated upon and the mortality in this group was 92 per cent. The last figure includes those who died in the emergency room and those who died shortly after admission. Eighteen were operated upon within twelve hours of receiving the injury with a mortality of 16 per cent. Seventeen operated upon after twelve hours had a 23 per cent mortality.

#### INJURIES OF THE SOLID ORGANS

Injuries of the liver, spleen, and kidneys are more likely to result from sudden blows than from slow compression. Their partial fixation enables them to tolerate slowly applied pressure fairly well.<sup>6</sup> Injuries of the pancreas are rare and are often associated with other serious lesions forming a fatal combination. The liver and spleen are most frequently injured.

*Liver.* Liver injuries may be classified

according to Sheddon and Johnston<sup>7</sup> into three groups: (1) rupture of liver tissue with simple laceration of Glisson's capsule represents minimal trauma; (2) separation of the capsule by subcapsular hemorrhage and damage to underlying structures; and (3) a central rupture with hemorrhage into the parenchyma with later abscess formation.

Small tears will seal themselves off with comparatively little bleeding. This is especially true in liver injuries received in warfare. Robt found that only 1 of 34 cases needed surgery to control hemorrhage. On the other hand, the ruptures caused by nonpenetrating trauma usually result in profuse bleeding and the syndrome present after a short time is one of serious internal hemorrhage.

The early diagnosis of liver rupture is made by the history and the site of trauma, signs of intraperitoneal hemorrhage, localized tenderness, rigidity (has a tendency to spread), and elevation and immobilization of the right leaf of the diaphragm. The bradycardia (50) noted by Finsterer<sup>9</sup> may be present but should not be considered as characteristic of liver injury. It is noted in rupture of duodenal ulcers and in massive hemorrhage not of liver origin. The cause of pulse rates between 50-70 per minute is attributed to vagal stimulation. The blood pressure may be sustained, especially in young individuals with elastic vessels, for a long period, dropping rapidly to zero when death approaches. Small quantities of blood in the abdominal cavity cannot be demonstrated and attempts to percuss shifting dullness<sup>10, 11</sup> are to be condemned rather than encouraged. Patients with intra-abdominal injuries should be kept quiet; movement only adds to shock and tends to start bleeding that has been arrested by clotting. We do not encourage abdominal wall puncture for the diagnosis of hemoperitoneum.

Blood studies are of little help in determining the severity of hemorrhage in the first few hours.<sup>10</sup> We must depend almost entirely on our own observation of the patient and an accurate appraisal of his gen-

eral condition to guide us to the correct diagnosis and the decision to operate or to wait.

Symptoms and signs which appear later are jaundice, peritoneal reaction to blood and bile, abscess formation, and the toxic effects from liver necrosis.

Operation is indicated when there is evidence, or even suspicion, that bleeding is progressing. An adequate incision that will permit complete exploration of the abdominal viscera is imperative. Hemostasis may be difficult to accomplish. Mattress sutures of catgut on atraumatic needles sometimes are sufficient to stop bleeding; however, packing must be resorted to frequently. Long narrow strips of gauze placed against the raw surfaces will arrest hemorrhage and provide for drainage. One of the newer hemostatic agents may be used in conjunction with the pack, although these agents may enhance liver sequestration. Whether packs or sutures are used, *drainage is imperative*. The death rate is extremely high in those patients who are not adequately drained.

Rupture of the liver occurred in 23.6 per cent of the 55 cases. This percentage is at variance with many of the published statistical studies of similar injuries. There were 13 patients with liver injuries. Eight of the 13 had no evidence of injuries of other abdominal organs, although there were intracranial hemorrhages in 2 of the newborn infants. None of the 8 patients survived. The one patient who was operated upon and closed without drainage died on the tenth postoperative day. The remaining 5 patients had multiple injuries of solid viscera. In none was a hollow viscus injured. Three were operated upon: one with rupture of the liver, spleen, and left kidney died one hour after operation; the second with rupture of the liver and one kidney died during the operation; and the third survived after splenectomy and suture of a laceration of the left lobe of the liver. The mortality in the 5 complicated cases was 80 per cent.

*Spleen:* One would think that because of its location and size the spleen would be in-

vulnerable to injury. Yet it is one of the most frequently injured abdominal organs and has taken precedence over the liver in this group of cases. The architecture of the organ is such that even mild trauma may result in tearing of its soft parenchyma. Unlike small wounds of the liver, once tearing of splenic tissue has occurred, there is a tendency for bleeding or oozing to continue for a long time.

Clarkson<sup>2</sup> divides injuries of the spleen into three groups. In the first group, rupture is followed immediately by massive hemorrhage which rapidly progresses to a fatal issue; the vessels in the main pedicle are torn. In the second group are placed those ruptures with initial hemorrhage and collapse, then recovery. After a latent period, usually hours, hemorrhage again occurs which without splenectomy will result in death. In the third group are placed the subcapsular hematoma. In these the splenic pulp is torn under an intact capsule. These are dangerous; while the bleeding continues and pressure under the capsule increases, there is a period of two to ten or more days when the patient seems to have no serious intra-abdominal injury. When all seems perfectly well within the abdomen the hematoma breaks through the capsule and profuse hemorrhage occurs. We believe that two patients in the series being discussed died from profuse secondary hemorrhage following ruptures of subcapsular hematoma. A third had the spleen removed when a large subcapsular hematoma was found at exploration.

An accurate diagnosis of rupture of the spleen frequently is impossible to make. The nature and site of the injury, combined with pain, tenderness, and rigidity, will direct attention to the abdomen. At times these symptoms predominate in the left upper quadrant, indicating that the spleen most likely has been injured. Added to these are the signs of intra-abdominal hemorrhage; these findings were the only constant factors in our group of cases and indicated the probability of splenic injury. Pain in the left shoulder is mentioned as a very helpful symptom by some authors; we



have found it present only once in 23 cases—the patient had a fracture of the left humerus. Decrease in the respiratory excursion on the left side may be due to rupture of the spleen, fracture of the lower ribs, or both. The possibility of splenic rupture with early or delayed hemorrhage must be borne in mind in all patients with rib fractures of the left side.

Abdominal exploration is indicated when injury of the spleen is suspected. Splenectomy is advised even in patients with hematomata for reasons that have already been stated. Careful examination of the left diaphragm for rupture should invariably be done because the lesions are sometimes associated.

There were 23 ruptured spleens in the series, 41 per cent of 55 patients. Sixteen were the result of vehicular accidents, 6 from falls, and 1 from a blow. Eighteen (81.6 per cent) were not associated with injuries of other abdominal viscera while 6 (18.4 per cent) had associated kidney, liver, urinary bladder and retroperitoneal lesions.

Two patients, aged 60 and 70, had fractured skulls and died without operation. One, aged 79, died from pulmonary edema on the third day without surgical intervention. The fourth death occurred one hour after surgery and was probably due to shock. Splenectomies were done on the remaining 14 patients. The mortality with splenectomy was 6.3 per cent; without, 100 per cent.

Of the group of 5 patients with multiple abdominal injuries, 4 were operated upon with a mortality of 50 per cent. One, not operated upon, died.

The total mortality from rupture of the spleen, including all cases, was 34 per cent.

*Kidney:* Campbell<sup>12</sup> estimates that the relation of renal trauma to surgical admissions is 1:3,000. He considers hydronephrosis, calculi, and long standing urinary tract infection as predisposing factors. Ninety per cent of kidney injuries occur in the male.

Injury of a kidney by blunt force is recognized more readily than liver and spleen

injuries. Hemorrhage from an injured kidney will remain outside of the peritoneal cavity and produce a fullness in the region of the organ. Hematuria will be present unless the ureter is divided or the renal blood supply cut off by division of the pedicle or massive renal thrombosis.<sup>12</sup> Intravenous pyelograms are extremely helpful to determine the degree of renal damage, existence of perirenal extravasation, and the presence or absence and function of the other kidney.

Conservative treatment should be used when there is mild hematuria, no increase in size of the mass in the lumbar region, and the blood count hourly remains stationary.<sup>12</sup> Surgical intervention is indicated when there is evidence of extensive injury to the kidney or ureter, or when there is progressive hemorrhage, or extravasation of urine. Total or partial resection will depend upon the amount of damage found and the presence of another functioning kidney. Adequate drainage should always be provided.

Ruptures of the kidney were found in 9 per cent of the injuries we reviewed. Three cases were not associated with other abdominal injuries. One patient, aged 65, who had a crushing injury of the chest on the opposite side died. One of the 2 that lived was treated conservatively; the other was explored for rupture of the right kidney and was found to have a congenital absence of the left kidney. The mortality was 33.3 per cent.

Two patients who had kidney damage associated with liver and splenic injuries were explored; both died.

*Pancreas:* Nonpenetrating injuries to the pancreas are uncommon. Shallow and Wagner<sup>13</sup>, after a study of their 28 cases and the reported series of acute pancreatitis, determined that trauma plays a part in from 2 to 4 per cent of the cases. Because the pancreas is soft and very vascular, mild force applied anteriorly may cause injury. According to Venable<sup>14</sup> the tear or rupture that occurs may be complete or incomplete, and may divide the duct of Wirsung. Trauma is followed by edematous

or hemorrhagic pancreatitis. The latter usually results in the formation of abscess or pseudocyst. Hemorrhage that follows rupture remains retraperitoneal and forms a mass above the umbilicus.

The diagnosis is made on the following findings: (1) Presence of moderate to very severe pain in the upper abdomen following trauma; (2) development of a mass above the umbilicus; (3) after a short time a large collection of ascitic fluid;<sup>10</sup> (4) a rapid early rise in serum amylase (high normal 180 Semogyi units). Edmondson and Burne<sup>15</sup> found the serum calcium below 9 milligrams per 100 cubic centimeters if there is a hemorrhagic element; values below 7 indicate a fatal outcome.

Treatment by conservative measures should be employed as long as there are signs of clinical improvement. Patients who do not improve but seem to get worse during a six to eight hour period of observation should be explored. Adequate drainage should be established to prevent the spread of peritonitis and the formation of abscesses and pseudocysts.

There were no patients with clinical or necropsy evidence of pancreatitis in our series.

#### INJURIES OF HOLLOW VISCERA

Immediately following injuries of the trunk it may be impossible to determine definitely the presence or absence of intraperitoneal lesions. The "pseudoperitoneal syndrome" or "traumatic peritonism" of Eliason<sup>17</sup> and Hinton,<sup>18</sup> occurring immediately after injuries of the chest and retroperitoneal area, may be misleading; these injuries very closely simulate intraperitoneal injury. Although confusing at first, the false signs tend to improve early while the true signs and symptoms of peritoneal reaction become worse with time. The presence of air when found by x-ray examination is conclusive evidence that real bowel pathology exists.

The most important findings that point to injury of the gastrointestinal tract are: (1) the history and site of trauma; (2) localized pain, tenderness, and rigidity,

which persist and at the same time have a tendency to spread; (3) absence of peristaltic sounds; (4) the quiet attitude of the patient; (5) loss of abdominal respiratory movements; (6) a rising pulse rate; (7) persistent vomiting; (8) the extremely important finding of free air or gas in the peritoneal cavity or in the region of the right kidney; (9) a rapidly increasing leukocytosis, with polymorphonuclear leukocytes predominating; (10) abnormalities of the hematocrit, hemoglobin, red cells, and specific gravity of the blood. Absence of one or more of these does not rule out the existence of serious injury.

It is important that x-ray examination be done with the patient supine, prone, in the right and left lateral, and upright positions if the condition of the patient permits. The presence of free air indicates most likely rupture of the stomach, duodenum, upper jejunum, or colon; the lower jejunum and ileum are less likely to show free gas.

Ruptures of the stomach wall, peritonealized portion of the duodenum, and large tears in the small and large bowel, will show early and progressive signs of acute pathology in the abdominal cavity; so, one can hardly overlook the fact that a grave abdominal emergency exists. There are other injuries, however, that are not as evident and are frequently unsuspected until symptoms and signs of local peritonitis with abscess formation or spreading peritonitis appear days after the injury.

Among the traumatic lesions that present the latent period are: retroperitoneal injuries of the duodenum; small blowouts and tears of the intestine without eversion of the mucosa that seal themselves off temporarily, only to rupture later; and extra-peritoneal injuries of the rectal wall.

Lesions that have such a protracted, quiet interim, before the storm, illustrate the inadequacy of a twenty-four hour period of observation. One patient in our series appeared normal until the sixth day following the trauma, when diarrhea occurred; this was followed by secondary rupture of a small diverticulum of the de-



scending colon that had been sealed off by a hematoma. Recovery followed rehospitalization and laparotomy with drainage of the abscess.

Once the diagnosis of ruptured hollow viscus is made, or when it is doubtful because rupture cannot be excluded, surgery should not be delayed. While the urgency for immediate operation is not as great as with intraperitoneal hemorrhage, unnecessary delay adds to the gravity of the situation and increases the mortality. Kornblith<sup>17</sup> cites figures for jejunal injuries which confirm our conviction regarding the folly of procrastination. This author reports that of those who were operated upon within six hours there was a 35-50 per cent mortality, after twelve hours 75 per cent, and beyond that with no operation 93-100 per cent mortality.

Included in our series was 1 rupture of the stomach, which probably occurred post mortem. There were no duodenal injuries. There were 6 ruptures of the jejunum: 1 complete division, treated by end-to-end anastomosis; 1 with two perforations of the wall, two and three feet distant from the ligament of Treitz, with a tear in the mesentery; and 4 others had small lacerations. There was no clinical evidence of shock in any of these patients. Five were operated upon within ten hours, and the sixth, seventeen and a half hours after the injury. There were no deaths; the usual reported mortality is 35 to 50 per cent.

There were 5 traumatic perforations of the ileum. That considerable difficulty is encountered in establishing an early diagnosis in tears of this portion of the intestine is shown in the lateness with which these patients were explored; only 1 was taken to surgery under ten hours from the time of the accident. One was operated upon forty-four hours after acquiring the injury, while another waited ninety-six hours before entering the hospital. The other two patients died twenty-eight and forty-eight hours after injury without operation. Shock was recorded as present in every patient. Generalized peritonitis was a marked fea-

ture in all save for the 2 who recovered. The mortality was 60 per cent.

There was one "blow out" of the cecum in a five day old patient, received during the administration of an enema by a mother inexperienced in this procedure. Death followed cecostomy.

The second large bowel injury resulted from a blow to the left lower abdomen. The true nature of the injury was not discovered until six days later when signs of local peritonitis and free air under the diaphragm were found. At operation a rupture of a small diverticulum with abscess formation in an old blood clot was found. The abscess was drained and recovery followed.

Injuries of the urinary bladder are identified by: (1) suprapubic pain; (2) signs of extravasation of urine into the peritoneal cavity or into the tissues of the abdominal wall; (3) hematuria, dysuria, or anuria; (4) abnormalities of the cystogram, using contrast media; and (5) fractures of the pelvis.

Three ruptures of the urinary bladder are recorded. All occurred in automobile accidents and the patients were in severe shock when admitted to the hospital. Two had multiple injuries and died after suprapubic cystostomy. One whose laceration of the bladder was sutured twenty-four hours after injury survived. There were no fractures of the pelvis associated with these injuries. The mortality was 66.6 per cent.

#### DIAPHRAGM

Ruptures of the diaphragm usually occur as a result of compression being applied to a tense abdominal wall or from puncture and laceration of this structure by indriven fragments of fractured ribs. The injury is suspected because of the dyspnea, cyanosis, pain in the chest, vomiting, peristaltic sounds in the chest, and is confirmed by x-ray examination. Repair should be done early to avoid possible strangulation of the abdominal organs which may become incarcerated in the rent.

There were three injuries of the dia-

phragm in this series, an incidence of 5 per cent. One occurred in a bulbospinal poliomyelitis victim who at the time was in a respirator. One had a fragment of rib driven through the right leaf of the diaphragm and into the liver. The third received a tear of the left leaf and a hematoma of the spleen. Closure was carried out in the third case; the first died from anoxia and the second died from multiple injuries before surgery could be carried out.

#### MANAGEMENT OF EARLY INJURIES

Serious injuries resulting from nonpenetrating trauma of the abdomen, while not common, occur frequently enough to warrant a definite plan of management. The excessively high mortality is in a large measure the result of careless handling and transportation of patients in shock, incomplete physical examination, and failure to observe patients for a sufficient period after injury. We suggest that the following general plan be employed:

1. Measures to combat shock must be instituted immediately. These include the intravenous administration of glucose-saline solutions and human plasma until whole blood is obtained. The presence and degree of shock is determined by the appearance of the patient. Normal pulse rates and blood pressure readings do not eliminate the presence of shock. The quantity of blood to be administered is determined by the needs of the individual patients; it should be supplied in adequate amounts, and lately we have been using arterial transfusions in the very severely shocked patients.

2. A detailed history should be obtained and a very thorough physical examination made. The important facts that must be ascertained are: (a) the presence and severity of injuries outside of the abdomen, with or without active bleeding; (b) the presence of progressive intraperitoneal hemorrhage.

3. Patients with active intraperitoneal hemorrhage will for the most part follow one of three courses: (a) will not respond to antishock treatment but will show pro-

gressive decline to death in about three hours; it is in this group that intra-arterial transfusions may prove to be of great benefit; but our past experience influences our current opinion that death will probably occur, regardless of what is done; (b) will respond to whole blood transfusions but cannot maintain the gain without further administration of blood; (c) will improve rapidly, demonstrating that hemorrhage has been arrested temporarily or permanently. Those patients in group *b* require immediate operation to arrest hemorrhage. Those in *c* require: immediate operation if the spleen is suspected; expectant treatment, if in the opinion of the surgeon, the liver is thought to be the source of the hemorrhage.

4. Hourly blood determinations, ten minute blood pressure, pulse and respiratory recordings should be made. These may or may not presage significant intra-abdominal injury.

5. Patients who show signs of abdominal injury but only mild shock and no evidence of intraperitoneal hemorrhage are not dire operative emergencies. Sufficient time may be taken to have the confirmatory laboratory and x-ray work done. Celiotomy can then be carried out with possibly a more definite diagnosis; if there is still doubt, operate.

6. Patients who present masses in the region of the pancreas will call attention to this organ; in the flank to the kidney or to retroperitoneal hemorrhages not of renal origin. Adequate investigation to ferret out the source of the bleeding is in order and unless the hemorrhage is alarming, which ordinarily it will not be, conservative treatment can be carried out.

7. Very careful consideration must be given to individuals whose first marked symptoms and signs are transient and in whom there is apparent early complete recovery. Since dangerous injuries with latent periods are usually found in this group, these patients should be hospitalized for observation. The length of hospitalization required is variable. Twenty-four hours is the usual time prescribed but this



is entirely inadequate for many; secondary hemorrhage from ruptured hematomata and reopening of perforations of the gut occur occasionally many days after acquisition of the injury. Periodic observation should be made at the patient's home after discharge from the hospital. If possibility of injury of the spleen exists, the patient should not be allowed to leave the hospital. We recommend explorations as the mortality from secondary hemorrhage of this organ is sufficiently high to warrant this procedure.

#### CONCLUSIONS

1. In this series of 55 cases the spleen was injured more frequently than any other abdominal viscus. Removal of ruptured spleens unassociated with other visceral injuries resulted in a mortality rate of 6.3 per cent.

2. Liver injuries were more frequently associated with other abdominal injuries and resulted in a higher percentage of fatalities. Liver damage occurs more frequently during birth than is suspected.

3. Injuries of the jejunum lend themselves to early diagnosis. They were the most common gastrointestinal tract injury in the series. Early diagnosis and treatment resulted in 100 per cent recoveries.

4. Ruptures of the ileum proved to be more difficult to diagnose and more deadly to the patients.

5. Observation of patients who have had nonpenetrating trauma of the abdomen should extend well beyond the usual twenty-four hours prescribed.

6. We believe that the application of knowledge garnered from others' experiences in dealing with nonpenetrating injuries of the abdomen, consciousness of their occurrence, particularly with relatively mild trauma, their association with other injuries, and the adoption of an orderly plan for investigation and treatment will be of immeasurable help in lowering the present high mortality and preventing the occurrence of disabling remote complications.

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### PRINCIPLES OF EMERGENCY SPLINTING, TRACTION AND IMMOBILIZATION OF FRACTURES\*

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Seldom is emergency splinting correctly applied, although its value has long been recognized and its use widely recommended. Through the concerted efforts of the pro-

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fession the status of emergency transportation and treatment of the injured has been greatly advanced; however, there is room for further improvement in the early management of fractures. The intent of this paper is to outline the standard principles of early fracture management and to review the improved methods of transportation and immobilization of long bone fractures.

#### EMERGENCY SPLINTING AND TRANSPORTATION

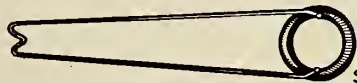
Following is a summary of standard forms of splinting and transportation to be used at the time of acute traumatic bone injuries of the extremities and of the spine.

### • FRACTURES OF HUMERUS •

#### THOMAS SPLINT



(MURRAY-JONES HINGED MODIFICATION)



Same splint  
as applied  
above

FIG. 1.

The hinged Thomas arm splint (Murray-Jones) (Fig. 1) is most satisfactory for fractures of the shoulder, upper humerus, shaft of the humerus and the elbow. The splint should be applied snugly to the axilla without removing clothing. Traction on the extremity prevents motion at the fracture site thereby lessening the severity of associated pain and/or shock from the injury. An acceptable and more readily available method of splinting for similar fractures is to strap or bandage the arm to the chest wall. (Fig. 2B.) The thoracic cage itself makes an extremely satisfactory splint.

For fractures of the forearm, padded boards are securely strapped on volar and dorsal aspects of the forearm and provide sufficient immobilization for transportation. (Fig. 2A.) Careful checking of this type of splinting should be made hourly for signs indicative of vascular damage such as swelling, cyanosis, or coldness of the

### • SPLINTING FOR TRANSPORTATION •

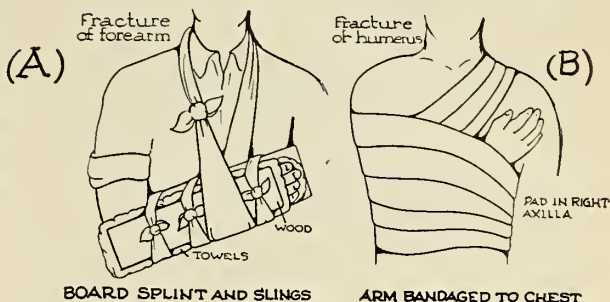
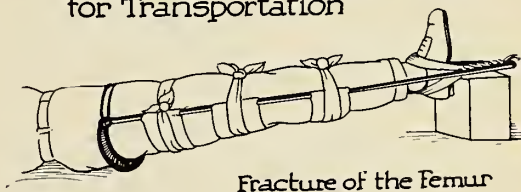


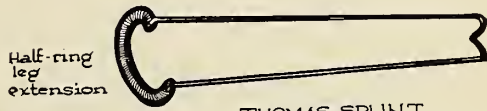
FIG. 2

fingers. Metal splints of various designs have been used for some years and when correctly applied, with subsequent close observation, afford adequate splinting for immediate transportation of fractures of the upper extremity.

### • EMERGENCY SPLINTING • for Transportation



Fracture of the Femur



Half-ring  
leg  
extension

THOMAS SPLINT

FIG. 3

(KELLER HALF-RING MODIFICATION)

The Thomas leg splint (Keller half-ring modification) (Fig. 3) is used for splinting and transportation of fractures of the lower extremities above the ankle and the foot. When correctly applied at the site of the injury, with shoe and trousers on, this splint provides traction and lessens the probability of compounding a closed fracture and of deepening the shock usually accompanying a long bone fracture. Thomas splints are made with full rings and with half rings, the latter type being recommended because of ease of storage and application.

Splinting the thigh or leg may also be efficiently accomplished by bandaging the uninjured leg to the injured leg from the



groin to the toes. A board extending from the axilla to the toes may be used for splinting in this region. (Fig. 4 A.) This enables

### • BOARD SPLINTING • For Transportation

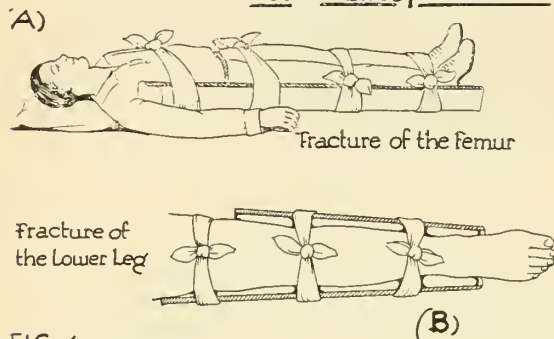


FIG. 4

the patient to be moved as a unit. Board splints on the lateral and medial aspects of the leg are used to splint fractures below the knee. (Fig. 4 B.) Some type of "gutter" splint may be used for transporting fractures of the lower leg and foot. (Fig. 5.) Heavy cardboard is a desirable material to use, for it is firm enough to give immobilization yet malleable enough to conform to the contour of the extremity and to prevent lateral angulation at the fracture site.

### • GUTTER SPLINT •

Fracture of Foot and Ankle

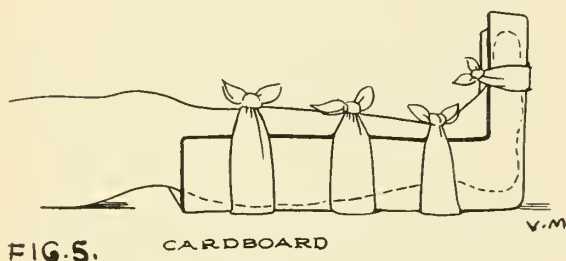


FIG. 5.

As the majority of spine fractures are flexion injuries, strict adherence to the principles of extension or hyperextension of the spine often prevents further damage to the patient. This may best be demonstrated by two principles, namely: keeping the patient in the prone position while lift-

ing him, and by carrying him face down on a litter or board so that the prone position is maintained until more detailed examination is possible. (Fig. 6.)

### • INJURIES OF THE SPINE •

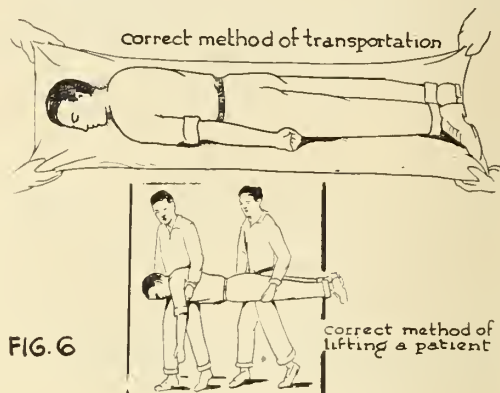


FIG. 6

#### METHODS OF TRACTION

The reasons for the use of traction in the treatment of fractures are: (1) immobilization; (2) correction of deformity, and (3) restoration of limb length. Skin traction is used when possible. Skeletal traction is employed in cases requiring more weight and pull than can be satisfactorily used on the skin or in cases with damage to large areas of the skin surface.

For the upper extremity, Blake's traction and Dunlop's traction are used. Blake's method (Fig. 7) is commonly employed for injuries of the shoulder girdle and upper

### • BLAKE'S TRACTION •

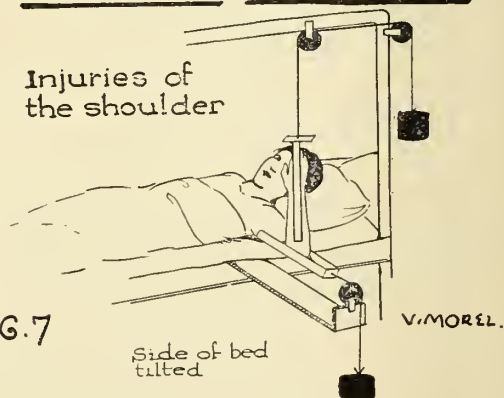


FIG. 7

humerus. After the skin has been prepared with an adhesive substance, such as tincture of benzoin or skin adherent, this form

of traction is applied by the use of strips of moleskin on the lateral and medial surfaces of the arm with lateral traction. To support the forearm another component of the traction is constructed by placing adhesive strips along the anterior and posterior surfaces of the forearm and attaching these to an overhead pulley with sufficient weight to maintain elevation of the forearm. Dunlop's traction (Fig. 8), pri-

### • DUNLOP'S TRACTION •

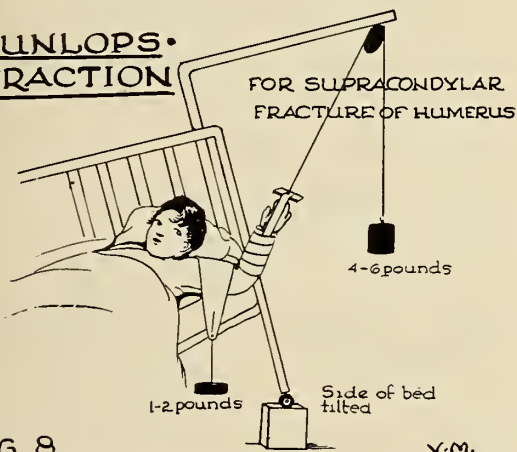


FIG. 8.

may be used when needed with Blake's traction. The usual sites for the insertion of pins (Fig. 9 B) are: (1) proximal end of the shaft of the ulna near the olecranon; (2) the distal end of the shafts of ulna and radius, and (3) distal portion of the shafts of the medial four metacarpal bones. After proper cleansing of the skin surrounding the area, strict aseptic technic should be followed during the insertion of the pins or wires.

Three forms of skin traction are commonly used for the lower extremity. Buck's traction (Fig. 10) is applied from the level of the tibial tubercle inferiorly, employing

### • BUCK'S TRACTION •

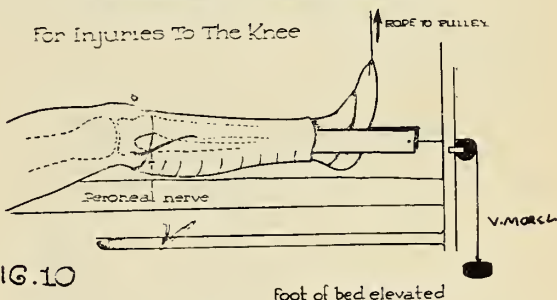


FIG. 10

marily designed for the reduction of transcondylar and supracondylar fractures in children, consists of skin traction applied to the forearm with lateral traction. The elbow is at 140 degrees and a wide padded sling is placed over the anterior surface of the arm with downward pull of 1 or 2 pounds. The corrective force of posterior displacement of the shaft of the humerus is thereby produced.

Skeletal traction in the upper extremity

### • SITES FOR SKELETAL TRACTION •

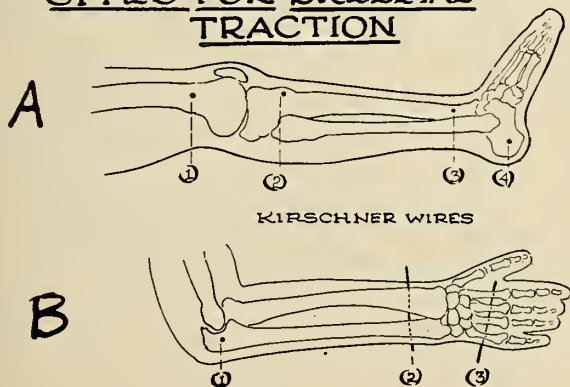


FIG. 9

the same material and method as described in the application of Blake's traction. The amount of pull obtained by Buck's traction is not great but it accomplishes partial immobilization in a fixed position. Care must be taken to avoid pressure on the peroneal nerve as it passes just distal to the head of the fibula. Padding should be applied beneath the tape at this location and also beneath the strips of adhesive as they pass.

### • RUSSELL TRACTION •

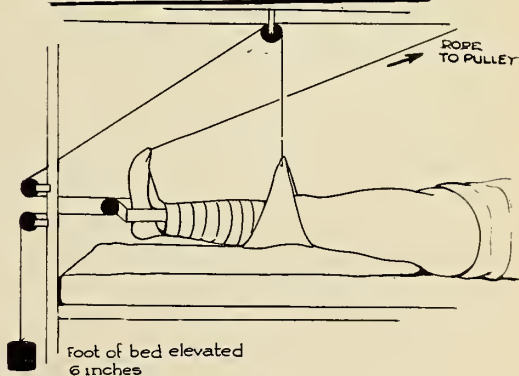


FIG. 11.



over the malleoli of the ankle. Elevation of the foot of the bed on blocks 6 to 8 inches in height will increase the effectiveness of the traction as the weight of the body acts as a force of countertraction. Boards should be placed under the mattresses of all patients in traction of the lower extremities for this allows the leg to glide freely and thereby decreases the amount of friction between the patient and the bed.

Russell's traction (Fig. 11) is applied in a manner similar to that of Buck's method, the difference being in the arrangement of the pulleys with the same amount of weight. A more effective traction results because the pulleys are so arranged as to allow for a compounding of forces which gives, theoretically, twice the pull of the attached weight.

### • BRYANT'S TRACTION •

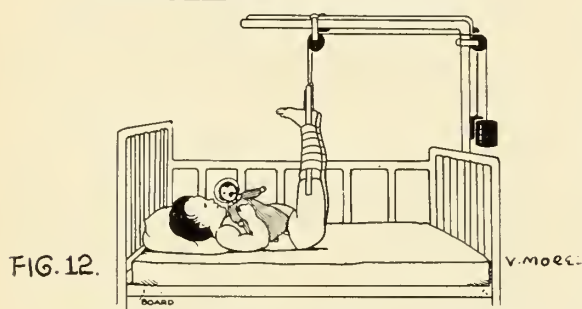


FIG. 12.

For Fractures of the Femur in Children.

Bryant's traction (Fig. 12) is a form of skin traction that was originally devised for the treatment of fractures of the femur in children. Adhesive strips are placed along both sides of the leg and thigh from the level of the fracture site distally. Padding is placed over the prominences of the femoral condyles, the peroneal nerve, and the malleoli. Bryant's traction is always applied bilaterally with the legs in complete extension at the knees and ninety degrees flexion at the hips. The pull is directly overhead and the amount of weight necessary to barely lift the buttocks off the bed is the recommended amount, subject to x-ray follow-up at the fracture site.

Skeletal traction is frequently used in the lower extremity. Sites for insertion of

wires or pins are illustrated (Fig. 9 A). A Kirschner wire or a 3/32 inch Steinman pin is recommended for the lower end of the femur, upper tibia, and lower tibia. A 5/32 inch Steinman pin is recommended in the relatively soft cancellous bone of the os calcis. For fractures of the femur a balanced skeletal traction is demonstrated (Fig. 13). The thigh and the leg are sus-

### • BALANCED TRACTION •

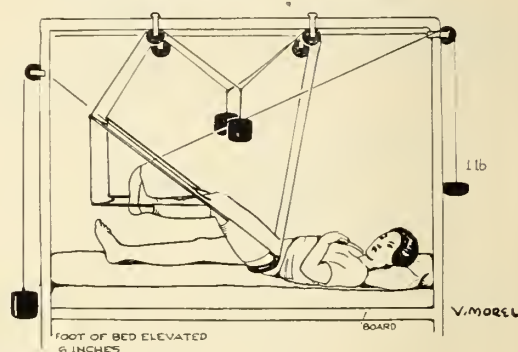


FIG. 13

pended by pulleys to an overhead frame. The traction is maintained in the longitudinal axis of the femur by traction on a wire through the tubercle of the tibia. It is important that the leg below the pin site be elevated with the ankle higher than the knee to insure against dependent edema. A foot piece of some sort is attached so that the ankle is maintained at a right angle. The foot of the bed should always be elevated and a board placed under the mattress.

### • BRAUN'S FRAME •

For Fractures of Tibia and Fibula

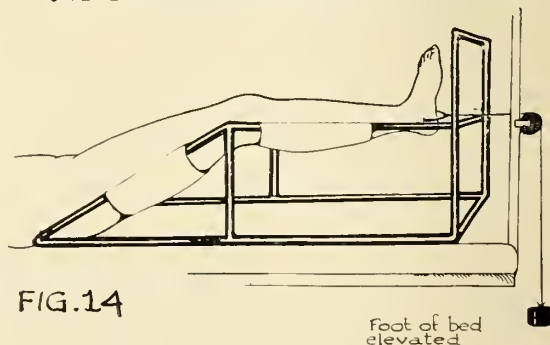


FIG. 14

The Braun frame (Fig. 14) has been used to demonstrate a type of skeletal trac-

tion for treating oblique and or comminuted fractures of the tibia. The pin is placed through the os calcis or the lower end of the tibia and the pull is in line with the long axis of the tibia. The leg and the thigh are suspended on the frame by slings. It is frequently necessary to apply a long padded posterior plaster splint to the extremity so that rotation of the distal fragment at the fracture site is prevented. A hard bed with elevation at the foot is required for this method.

When it is necessary to apply traction to the cervical region, the halter (Fig. 15 A) is commonly employed with a re-

### • TRACTION TO CERVICAL SPINE •

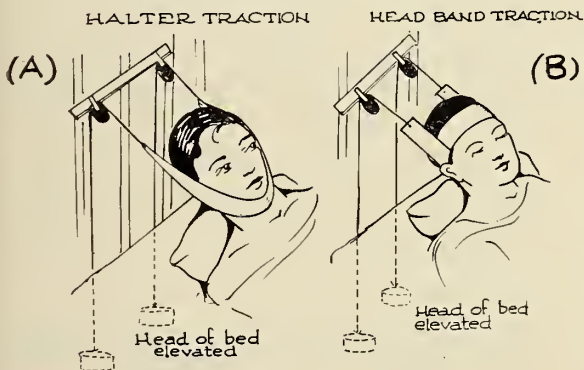
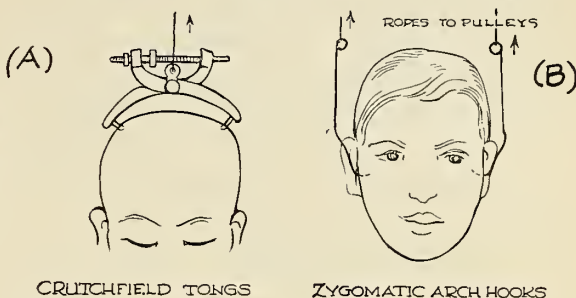


FIG. 15

stricted use due to maximum weight tolerated by the patient, 4 or 5 pounds in most cases. For the patient's comfort and for ease in nursing care, it is recommended that two pulleys be used, one attached to each tail of the halter. When necessary to use a small amount of weight over a long period of time, a head band type of traction may be used. (Fig. 15 B.) Made of webbing with adjustable buckle, this band engages the occiput and the frontal bosses for purchase and is also applied with two pulleys. The head band is effective in children who do not easily tolerate the halter. When more effective pull is required there are other forms of skeletal traction which are used successfully. The Crutchfield tongs (Fig. 16 A) have been employed for a number of years and, when correctly applied, serve to maintain traction in the extended posi-

### • SKELETAL HEAD TRACTION •

For Injuries To The Cervical Spine



CRUTCHFIELD TONGS

ZYGOMATIC ARCH HOOKS

FIG. 16

V. MORELL

tion as is desirable. Zygomatic arch hooks (Fig. 16 B) may also be used for skeletal traction and may be fashioned by shaping a small Steinman pin. They are easily inserted in the bedside under local anesthesia. Two pulleys should be used and the amount of weight will prove sufficient to obtain traction for any condition present. By whatever method selected, the head of the bed should be elevated from 6 to 8 inches and the bed should be a firm one. Any desirable amount of hyperextension can be produced and maintained by placing additional mattresses and pillows beneath the upper portion of the trunk of the patient.

### PLASTER IMMOBILIZATION

We have demonstrated what may be considered as the functional position of the upper extremity, and feel that the following positions should be maintained as often as possible, subject to individual fractures, when plaster of Paris casts are used for immobilization. This includes flexion of the elbow to 90 degrees, midposition of the forearm with respect to pronation and supination, 15 degrees of dorsiflexion at the wrist. If immobilization of the fingers is necessary, partial flexion of metacarpophalangeal and interphalangeal joints should always be employed. Long arm casts should extend from high on the arm inferiorly to the metacarpophalangeal joint on the dorsal surface of the hand and to the proximal palmar crease on the volar surface. (Fig. 17.)



• EXTENT OF LONG ARM CAST •  
For Fractures of Radius and Ulna

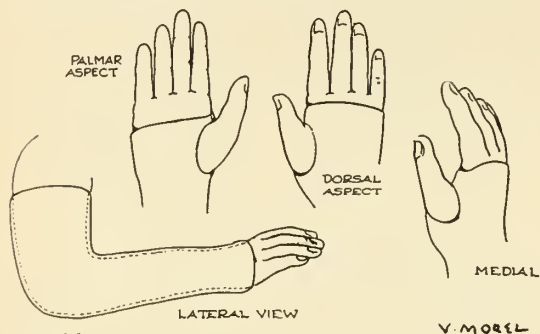


FIG. 17

In the lower extremity (Fig. 18) a long leg case should extend from as high on the thigh as can be comfortably applied, inferiorly to the base of the toes on the dorsum of the foot, and projecting beyond the toes on the plantar surface. Short leg casts should extend from the level of the tibial

• EXTENT OF CASTS IN LEGS •

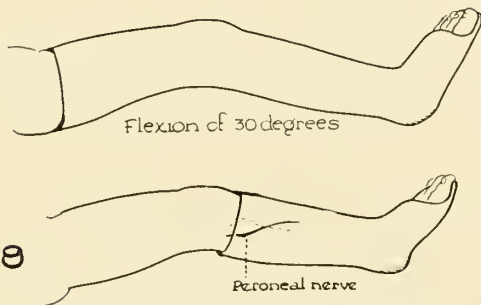


FIG. 18

tubercle to the toes, as mentioned above, with care taken to engage the head of the fibula laterally. Functional position in the lower extremities is accomplished by placing the knee at 150 degrees and the ankle at 90 degrees.

Padding of cotton sheet wadding or stockinette should be used under all casts for fresh fractures, with the addition of squares of felt around and over bony prominences. The use of plaster that is unpadded should be restricted to extremities in which there is an absence of swelling and no immediate possibility of swelling.

An example of further use of plaster is the hanging arm cast (Fig. 19) recom-

• HANGING CAST •  
Fracture of Shaft of the Humerus



FIG. 19

mended for fractures of the shaft of the humerus. With the ring attached at the level of the wrist or slightly below, the weight of the unsupported cast will produce traction and maintain reduction of the fracture. Injuries of the elbow and bones of the forearm should always be primarily immobilized in a long arm cast.

For immobilization of the femur, a spica and a half cast is necessary in order that the pelvis be fixed. (Fig. 20.) Adequate and positive immobilization of the knee may only be obtained with a spica cast, and

• PLASTER SPICA for FRACTURE of FEMUR •

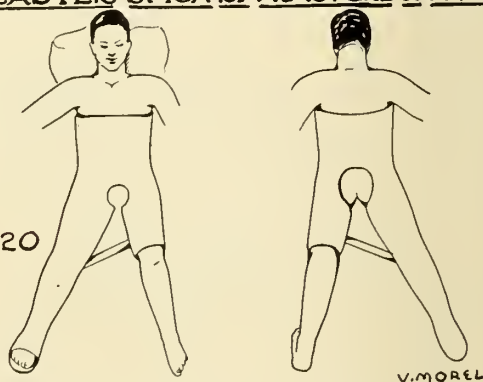


FIG. 20

all fractures of the tibia and fibula, including the ankle, should be immobilized in a long leg cast to prevent rotation at the fracture site. Injuries of the tarsal bones or any area distal to them are immobilized in a short leg cast.

A plaster body jacket (Fig. 21) is demonstrated for immobilization of the lower thoracic and upper four lumbar vertebrae. In order to illustrate the reduction of a

# • METHOD of REDUCTION and PLASTER FIXATION •

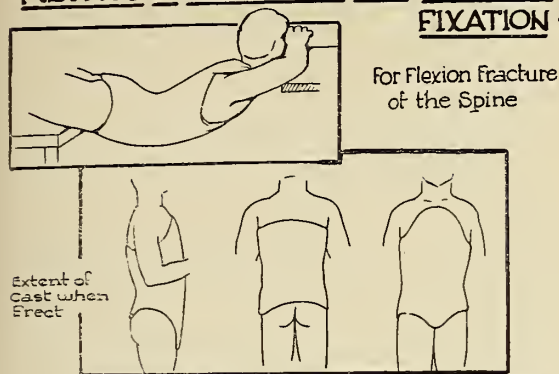


FIG. 21.

V. Monst

compression injury of the upper lumbar vertebrae we have elected to show the postural reduction method of placing the patient suspended between two tables for the application of the body jacket in this position. The extent of the cast anteriorly, laterally, and posteriorly, is demonstrated. (Fig. 21.)

Aftercare of a cast involves a few points worthy of consideration. A wet cast should always be placed on pillows to maintain an even pressure while the plaster is hardening and drying. This prevents the formation of depressions in the cast, which later would cause pressure sores. Elevation of the extremity is very important as the extremity will tend to swell following injury or surgery, and after the application of the cast. Elevation, with active and passive motion of the fingers and toes, will minimize the occurrence of swelling, cyanosis, or coldness—signs of vascular impairment. There should be no pain in the affected part following the application of a cast; however, a complaint of pain should not be lightly dismissed, particularly when the patient definitely localizes the pain. This may be a warning sign of a pressure sore, of necrosis of the skin due to the trauma, or of compounding of the fracture within the cast. Prompt attention and correction may save discomfort or serious complication.

## SUMMARY

We have attempted to set forth some of the basic principles associated with the immediate and proper splinting of fractures

for transportation; the correct application and uses of the various forms of skin and skeletal traction employed in the treatment of fractures; and the proper extent and padding of plaster casts, with some emphasis on the possible complications frequently resulting from the improper use of plaster, and the prevention thereof.

## TRAUMATIC SHOCK\*

HUGH C. ILGENFRITZ, M. D.

SHREVEPORT

Peripheral circulatory collapse is the commonest cause of death in patients who have suffered severe traumatic injury. Many individuals who have sustained fractures, lacerations, internal injuries, or even damage to the tissues of the central nervous system following violent trauma may recover without incident; others whose injuries appear to be comparatively minor may succumb to shock within a few hours.

Although many widely different etiologic factors may cause shock, the physiologic basis for the condition and the mechanism of its production still are not entirely clear. The clinical picture, however, is only too well known to every physician.

## CLINICAL PICTURE

The patient in shock is characteristically in a state of general collapse; although fully conscious, he may be scarcely able to speak or move. The skin is pallid, cold, and damp, occasionally exhibiting tiny droplets of perspiration. The pulse, at first relatively normal in character, soon becomes weak and thready, often with little acceleration in rate until the later stages of shock. Respirations are shallow, the expenditure of effort by the muscles of respiration being little more than barely sufficient to keep the patient alive. Occasionally a patient in the earlier stages of shock may be restless and excited; frequently also nausea and vomiting may appear. As the condition progresses, however, the excitement gives

\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 6, 1949.



way to dullness, apathy, and decreased sensitivity, until even the perception of pain may be lost. The blood pressure always falls, often to such a low level that it can scarcely be determined, and the temperature is typically subnormal.

Crushing injuries, especially with fractures of long bones and widespread devitalization of muscle tissue, are most likely to produce shock, which appears an hour or more after injury. Frequently, however, secondary influences such as loss of blood, chilling, insufficient fluid intake, severe pain, fear, or anxiety, may aggravate the effects of a comparatively minor injury and may produce shock unexpectedly many hours after the accident or may increase the severity of a state of shock already developing.

#### PHYSIOLOGICAL CHARACTERISTICS

While shock can be produced by many different types of injuries such as trauma, burns, or hemorrhage, the physiologic characteristics are much the same. As a result of local injury to the blood vessels following a traumatic accident, plasma and blood are lost into or from the tissues of the traumatized area. This withdrawal of fluid from the blood stream reduces the circulating blood volume, and the cardiac output and velocity of blood flow decrease correspondingly. Reflex peripheral vasoconstriction suffices to maintain the blood pressure above shock level for a short time, but as the vascular fluid loss continues or the compensatory vasoconstriction begins to fail, the blood pressure drops to shock level and tissue anoxia results, with asphyxia and depression of function of the heart, liver, kidneys, lungs, and brain. Hemoconcentration develops as the loss of plasma continues, the erythrocyte count and hemoglobin content of the blood rising in proportion to the withdrawal of plasma. At this stage, the capillaries throughout the body become anoxic and dilated, impounding large quantities of sluggishly moving blood. The increased viscosity of the blood interferes still further with its passage through the capillaries, and the venous return to the heart decreases concomitantly.

If the vicious cycle of shock is allowed to persist untreated for too long a time, the tissue asphyxia produces irreversible damage to the vital structures, and therapeutic measures then are of little value.

Traumatic or surgical shock does not appear instantly after the injury has been sustained but appears an hour or more later, since it depends upon a significant loss of blood or plasma. The collapse which follows immediately after a relatively minor injury is often called primary shock, but is actually a transient hypotension due to reflex vasodilatation on a neurogenic basis. Collapse of this type is similar to the sudden drop in blood pressure which may occur during spinal anesthesia or may follow a severe emotional reaction. Here there is a sudden fall in blood pressure as a result of the impounding of a large amount of blood throughout the dilated peripheral vascular bed, but there is no loss of fluid from the blood stream, nor is there any change in the blood volume or the total cell mass. This reaction is temporary and recovery is usually prompt.

Oliguria or anuria may follow traumatic or surgical shock, probably as a result of decreased blood flow in the renal vessels. As a rule, kidney function returns to normal after shock has been controlled by blood transfusion. In some cases, however, especially in the presence of extensive crushing injury, a characteristic renal lesion occurs, with resultant anuria which may prove fatal. The suppression of renal secretion in the crush syndrome is accompanied by necrosis of the distal tubular epithelium in the kidney; this condition, similar to that occurring as a result of severe hemolytic transfusion reaction, has been called "lower nephron nephrosis." While prophylactic measures probably are of little value in preventing development of the condition, it should be foreseen when severe crushing injuries are present. Treatment for shock is instituted as promptly as possible in such cases and, as soon as the patient is in satisfactory condition for operation, all devitalized tissue is excised, fascial compartments are split if the under-

lying muscle appears tense or swollen, and amputation is performed when indicated. It is a wise precaution to chart the daily fluid intake and urinary output in every patient who has suffered a severe traumatic injury, but it is especially advisable when crushing injuries are present.

#### TREATMENT

Before surgical treatment of a moderately severe traumatic injury is begun, the possible presence of a preshock state should be considered. Even though tissue damage has been relatively severe and a significant amount of vascular fluid loss has occurred, the blood pressure may be maintained within a relatively normal range for a short time by reflex peripheral vasoconstriction. A patient thus may be on the verge of collapse and yet may be able to talk or even sit up. If repair of injuries is attempted before treatment of impending shock is begun, the preshock state may progress suddenly to profound collapse. Premonitory signs of threatened shock include anxiety, agitation, restlessness, pallor, cold clammy skin, rapid soft pulse, and a moderate drop in blood pressure. The reduction in blood volume cannot always be demonstrated early in the course of the posttraumatic state by means of blood counts and hematocrit determinations. Even though enough blood or plasma has been lost following injury to produce a state of shock, the erythrocyte count and the hematocrit value may still be within the normal range for a variable length of time after the accident.

The best treatment of shock is prevention. Many patients who could survive their injuries die of the associated shock. The treatment of fractures, lacerations, head injuries, and even of thoracic and abdominal trauma can wait with safety for one or more hours if necessary until the blood volume has been restored by transfusion, the blood pressure has risen to a safe level, and the patient is no longer in danger of shock. The only two surgical emergencies which offer a greater threat to life than secondary shock are continuing hemorrhage and obstruction of the respiratory tract. Either of these conditions must be relieved

instantly; this having been done, the treatment of actual or impending shock takes precedence over the care of any other surgical condition.

The injured patient is disturbed as little as possible; measures are taken to prevent further injury and to reduce discomfort. Fractures are splinted, wounds are covered with sterile dressings, and morphine is administered if needed. Definitive treatment of injuries is postponed until after shock or impending shock has been brought under control. Blankets are used to conserve body heat; hot water bottles or heating pads are not used, to avoid increase of blood flow in the skin and consequent withdrawal of blood from the vital centers. Morphine is given for pain, but never when undiagnosed visceral damage may be present. Stimulant drugs are used only to help maintain the blood pressure at a relatively safe level until transfusions or infusions can be secured. Such drugs are of much value in neurogenic hypotension, when injury has been slight, but are potentially dangerous when the fall in blood pressure is accompanied by significant reduction of the total blood volume.

Restoration of the depleted blood volume is best accomplished by transfusion of whole blood; enough is administered to raise the systolic blood pressure at least to a level above 100 millimeters of mercury. The quantity of blood which may be required varies according to the extent of trauma, the length of time that has elapsed since the injury, the condition of the patient before the accident was sustained, and the amount of blood or plasma which has been lost. In some cases, a state of impending shock can be treated successfully with a single transfusion of 500 cc. of whole blood; in other cases, 40 per cent or more of the total blood volume may have been lost, and from 1,500 to 2,500 cc. of blood may be required for full replacement.

If blood is not immediately available, plasma is the best substitute; it is given rapidly and in sufficient quantity to raise the blood pressure safely above shock level.



No attempt is made to restore the blood volume entirely to normal by transfusion of plasma alone, since the red cell deficit also must be corrected by subsequent administration of whole blood.

If plasma is not available, normal salt solution, with or without dextrose, is given slowly by infusion until compatible blood can be obtained. While less satisfactory than plasma as a substitute for blood, crystalloid solutions are of lifesaving value in supporting the depleted blood volume for a short time.

Other blood substitutes, such as solutions of concentrated human serum albumin and of purified gelatin, appear to be of much value but are not generally available; still others, such as pectin and bovine serum albumin, are efficacious but are unsafe for general use because of their toxic properties.

#### SUMMARY

Traumatic shock, especially when combined with hemorrhage, is the commonest cause of death following accidental injury. Loss of blood and plasma from the damaged vessels in the traumatized area causes a significant reduction in the circulating blood volume, with a resultant drop in blood pressure and cardiac output below the levels necessary for the maintenance of life. The possible development of shock should be foreseen in any extensive traumatic accident; it can be recognized in its earliest stages by the presence of a persistent reduction in systolic blood pressure. Shock is better prevented than treated once it has developed, since the widespread tissue anoxia caused by the peripheral circulatory collapse may cause irreversible damage to the vital organs within a short time.

Treatment of traumatic shock includes (1) prompt recognition of shock or of a pre-shock state; (2) transfusion of whole blood as soon as possible, with the use of plasma or normal salt solution as temporary substitutes; (3) use of analgesic and sedative drugs as required to relieve pain and anxiety; (4) prevention of loss of body heat; and (5) avoidance of further injury and

postponement of corrective surgical procedures until after shock has been controlled.

#### DISCUSSION

Dr. C. E. Boyd (Shreveport): I would like to ask why glucose should not be used in head injuries?

Dr. Dean Echols (New Orleans): I have been asked why I lost interest, as most neurosurgeons have, in giving hypertonic solution to people with severe brain injuries. It is true, in almost every neurosurgical center in the United States, that the custom of giving 100 cc. of 50 per cent solution of glucose or sucrose intravenously every four hours to patients with head injuries has been abandoned. The reason for the loss of interest in the once popular "dehydration treatment" is probably the acquisition of the knowledge that the brain is rarely swollen, as previously believed, in severe cerebral injuries. Also, as pointed out in the paper, when spinal punctures are performed on patients with head injuries, the surgeon invariably discovers that the pressure is normal or subnormal. Extensive experimental work on animals and humans in recent years has confirmed this clinical observation. These investigations have shown that there is no cerebral edema of any great consequence in the absence of gross hemorrhage. Therefore, almost everyone agrees now that it is important, not to withhold fluid from the patient, but to give him an almost normal amount from the beginning.

Dr. C. E. Boyd (Shreveport): The reason for that question is that in 1935 at the Charity Hospital in Shreveport some one found that the mortality of head injuries was much lower in Charity Hospital than when neurosurgeons attacked them earlier. That perhaps led to that treatment in vogue here. Since then I read Dr. Echols' article and it is hard to realize or to accept that in severe brain injury without hemorrhage there should be decrease in pressure. I accept his presentation, however.

Dr. Isidore Cohn (New Orleans): In the first place I am particularly happy over this symposium as it is the first time that I know of that the surgical program in the State Society has been devoted to the subject of trauma. One particular reason that I am interested is because, through the efforts of the College of Surgeons' Committee on Fractures and Other Traumas, we are trying to stimulate interest in early adequate handling of trauma. I was so happy over Dr. Echols' paper that I asked if he would give me a copy so that it might be distributed to the members of the committee on trauma throughout the country. With few exceptions he discussed the subject from the standpoint of fundamentals. He has given us a great deal to think about.

I was particularly impressed by the presentation

of Dr. Miangolarra because a little over a year ago I worked with one of the residents at Charity, Dr. Waters, on this same subject.

The important thing is for us to be conscious of the fact that when an individual has a non-penetrating injury, such as a fall or blow on the abdomen, we have to be conscious of the possibility of rupture of the spleen and damage to the liver or damage to the hollow viscera. If we continue, as some do, to see these individuals with a non-penetrating abdominal trauma and send them home, in twenty-four hours or less time, then they come back in a state of shock. My first interest was gained in the old Shreveport Charity Hospital in 1905 when a man was injured by the tail-gate of an express wagon shoving him up against the wall of the railroad station. That man walked to the hospital and did not complain of pain. The house surgeon and interne saw him and nothing was said or done about it and in about four hours the man's abdomen became rigid and autopsy showed it was full of blood and the liver was torn to pieces.

Rupture of the diaphragm, liver, or spleen is not going to be found unless we are conscious of the possibility, and we are going to save a great many more of these people if we do not say "go on home and go to bed," but put them in a hospital where they can be observed carefully and do something about the condition as quickly as possible.

I was particularly impressed by the simplicity of the paper by Drs. Alldredge and Banks. I think that kind of thing is something we all should know more about and do more about.

Dr. Ilgenfritz' paper, the question of management of shock, should impress all of us with the importance of using whole blood and not substitutes. Whole blood is the thing and I think blood bank or catastrophe management should be started. The sooner we become interested in that the more patients we will be able to save.

Dr. J. Q. Graves (Monroe): I was deeply impressed with the idea brought out by Dr. Echols regarding the use of 50 cc. of 50 per cent glucose in the treatment of patients who have sustained head injuries.

The theory of brain injuries in the past, was that edema is associated with the injury, and that concentrated glucose given intravenously would be of benefit, in that it would produce a dehydration. It is refreshing to know that fluids can be given freely, intravenously, without fear of increasing brain pressure.

When complications, such as coma, mild or deep coma, follow injuries of the brain, we now know, they are not due to edema, but caused by a hemorrhage. If the coma deepens and the reflexes are destroyed, surgery is to be thought of. With x-ray and clinical study, localization of the hemorrhage

will be determined. If there is evidence of continued hemorrhage, an effort to locate and ligate the bleeding vessel is indicated, and at the same time, to remove all blood clots.

Your symposium regarding traumatic injuries to the abdomen is the opening up of an almost forgotten subject, one which is often presented to the industrial surgeon. Abdominal injuries should be studied carefully for several hours, or until sufficient time for all complications to have developed before one is considered out of potential danger. It is best done in an institution. In some instances, relatively insignificant abdominal trauma can be responsible for an abdominal catastrophe or a tragedy. A full stomach or bowel, under favorable conditions, can be easily ruptured. The spleen and liver are two of the most vulnerable organs of the abdominal cavity. Both are easily damaged, and at times, to the extent of death. In all abdominal injuries careful study should be made of pulse, respiration, temperature and blood pressure reading. If they are followed closely, early signs of impending danger can be detected. If the clinical picture presents sufficient evidence for surgical interference, an exploratory should be done early.

Dr. John G. Snelling (Monroe): As Dr. Cohn brought to our attention, the College of Surgeons is extremely interested in trying to spread the gospel of proper handling of traumatic injuries and it is certainly a fine doctrine to get over.

In so many of these injuries, as brought out this morning the first aid treatment is important, and that concerns, therefore, the general practitioner. I wish there were more of the general practitioners here this morning at this surgical symposium. I think really this thing should reach the general practitioners as far as possible, for they handle the case first. In addition I would like to say that the transportation and proper handling of these injured people by the ambulance crew, and/or laymen who first see the case, is also very important. If we keep preaching this we are going to spread enough of the gospel around to finally have the situation to the point where it is not perfect but much improved over what it has been.

Of course I am particularly more concerned with abdominal work, and thoracic to some extent, but as Dr. Echols brought out the general surgeon still has to handle head injuries of certain types, so he should be interested in all trauma. I have personally seen a couple of cases of delayed rupture of the spleen and liver and think it is highly important that the period of observation for people with any traumatic injury should be carried out meticulously. We should not get out of touch with these patients until we are absolutely sure that any chance of latent or dormant conditions manifesting themselves later, has well passed.



Dr. Branch Aymond (New Orleans): I am interested in the phase of vitamin K as to the part it plays in capillary oozing, and for this reason I would like to know if vitamin K would or would not be of benefit in the treatment of surgical shock, for instance, to include it in the infusion while administering same to the patient?

Dr. Hugh C. Ilgenfritz (Shreveport): I believe that in a patient whose blood prothrombin is considerably below normal, leakage of blood from damaged vessels would certainly be increased. If shock occurs in a patient who might already have a prothrombin deficiency for some reason, such as liver disease, poor diet, pregnancy, and so on, the use of vitamin K would certainly be worth while. When the blood prothrombin is normal, however, administration of vitamin K is not indicated.

Dr. M. B. Pearce (Alexandria): We see a good deal of traumatic injuries around Alexandria. We do not have the benefit there of specialists like Dean Echols to call on but occasionally we send Dean a case we can not handle as we would like to. This symposium on traumatic surgery has been most interesting to me. It is up to us who see the injuries early to take care of these patients. Some of you would not believe it if I would tell you of our experiences particularly in trauma of the spleen. Recently we had occasion to look up a few of our cases in traumatic rupture of the spleen, and believe it or not, we have not had a single death in some 18 cases. One of the last cases we had was a man some forty-seven years of age who had fallen on the ice; surgery was done forty-eight hours later. This patient was admitted to the hospital and x-rayed and found to have fracture of the ribs. The patient went home. The following day he was readmitted to the hospital. The family physician did not realize the fact of a ruptured spleen. I think the original injury did not have the hemorrhage we saw later. When I first saw him he was in shock about two o'clock in the morning and we had to give him two and a half pints of blood before we got him anywhere near a safety level. Even this individual at his age made a satisfactory recovery following splenectomy.

Recently, we have had a number of cases in children. One was a young boy eight years of age who was riding a horse. He pulled the horse up suddenly and the girth broke and he fell. The mother called the family physician and he told the mother to observe him for a while and if he did not get along all right to let him know. The child was pale when the mother called; she made no other comment. About three o'clock in the afternoon she called me and told me the child was pale and told what had happened. I advised her to bring the child in immediately to the office. I examined the child and realized immediately there was intra-abdominal injury. The child was sent

to the hospital and splenectomy done and there was uneventful recovery. Rupture of the spleen is the most common intra-abdominal injury and we should always be looking for it and always remember that the spleen ruptures very easily. We have had patients we were examining and thinking of rupture of the liver and find rupture of the spleen. We can not always make a correct diagnosis of rupture of the spleen. In three cases we thought of rupture of the liver and they had rupture of the spleen. Other injuries, particularly of the stomach and pancreas, we have found in a number of cases. Recently, we had a case of rupture of the pancreas with rupture of the duct and thought we were going to get continued fistula. It is impossible, of course, to do anything more than simple suture of the pancreas and one man did drain for quite a while. Later on I asked one of our surgeons what to do for continued drainage. He said just watch a little longer. We did and the fistula closed and there was no more trouble. We do see injury to the pancreas and I think when we explore a patient we certainly should explore the pancreatic region.

With the increased number of automobiles, there are more and more people getting in accidents and we are going to get more and more abdominal, head, and traumatic injuries of all types. I try to make it a rule to hospitalize every individual with head injury of any kind, whether unconsciousness occurred at the time of injury or not. Where possible I think all should be hospitalized and watched carefully for the first twenty-four or forty-eight hours. Many will be hospitalized needlessly but I do not think you will be doing the wrong thing. You can discharge the next day but I believe our constant observation of these cases is well warranted and the patient is entitled to it.

Dr. Gerald N. Weiss (New Orleans): I would like to know what Dr. Ilgenfritz thinks of the work of Dr. Shorr at the University of Cornell in connection with studies on vasotropic factors in experimental shock.

Dr. Hugh C. Ilgenfritz (Shreveport): I am sorry. I am not familiar with the work.

Dr. Weiss: I was interested in knowing what you thought of this work of Ephriam Shorr which was reported in the September 1947 issue of the *Transactions of the Association of American Physicians*. Shorr and his co-workers reported on their findings of vasotropic factors (a vaso-excitor material, VEM, and a vaso-depressor material, VDM) concerned with experimental traumatic and hemorrhagic shock in dogs. The vaso-excitor material in this humoral theory of shock also borders on the explanation of renal hypertension, which aspect is given consideration in the article referred to.

The principle is that shock, hemorrhagic or traumatic in nature, involves humoral factors

which regulate peripheral circulation. The distinction between reversible shock (during which time VEM predominates) and irreversible shock (during which time VDM predominates) is made clear. The VEM, produced by the relatively anoxic kidney, produces a vasoconstriction of pre-capillary sphincters of the capillary bed, conserving circulating blood and allowing for a "preferential circulation" during the reversible stage of shock. This stage can, of course, be corrected by transfusions and aided at times by adrenalin injection. The VDM, produced by the relatively ischemic liver and the ischemic skeletal musculature, causes a circulatory collapse with generalized capillary vasodilatation, and irreversible shock ensues. The "neutralization" and destruction of VDM was studied, pointing out that correction of "irreversible" shock may be possible. The subject was and is still being studied in great detail. It is actually another humoral theory of shock, one which you did not mention in your presentation. I was interested in your comments on this aspect of the subject.

Dr. Hugh C. Ilgenfritz (Shreveport): I am not familiar with the work; however the humoral idea of shock is one of the oldest of theories. Beginning with the work of Cannon during World War I, extensive studies have been made on the possible humoral mechanisms in the physiology of shock, and each successive report arouses further interest and controversy. I am sorry that I am not familiar with the work described and therefore cannot comment.

Dr. Monroe Wolf (New Orleans): In trauma of the kidney it was said you may not get bleeding. I have seen many cases at Charity and I have not seen one yet without microscopic blood. They are usually in considerable pain and shock when they come in. Usually there is tenderness on the side involved. Unless shock is extreme we give palliative treatment. We had three cases we nephrectomized; one a child three years old. He developed fever and we went in and found the whole upper kidney severed. I assisted the resident in doing the work. He had the severed section of the kidney in his hand and thought he had the pedicle. I had to assist in locating the pedicle.

In trauma of the bladder as well as urethra my policy is to do as little manipulation with catheter and so on as possible. I think you should open the belly in cases of rupture of the bladder. We have had recently a child about ten years old, a boy struck by a truck with a pelvic fracture, thigh fracture and rupture of the urethra. The resident took care of him. Fortunately he found communication of the urethral tear through the suprapubic cystostomy by passing retrograde sounds and inserted a catheter. He neglected to make counter incision in the perineum and drainage had to be done several days later.

As mentioned, drainage should be instituted at the time of surgery in case of extravasation, so that there will be no retroperitoneal infection from extravasated blood which may easily ascend retroperitoneally.

Dr. Dean Echols (New Orleans): I have the uncomfortable feeling that I have disappointed some of you in my indifference toward dehydrating medication. I would like to point out that I did not say that the intravenous administration of a 50 per cent solution of glucose should be avoided; I even mentioned indications for it. Perhaps I can summarize my viewpoint in this way. There certainly is no objection to giving 50 or 100 cc. of a 50 per cent solution of glucose intravenously, if one is confident that there is cerebral edema and increased pressure. However, the point is that the patient probably has cerebral edema and increased intracranial pressure because he has anoxemia. It was formerly believed that injury to the brain caused the swelling and that dehydration was the only course of action to overcome it. Now it is known that the cause of cerebral edema is not the initial injury but the anoxemia that follows, which is due to an imperfect airway. Therefore, a much more effective way to overcome the intracranial pressure is to improve oxygenation. If the patient has labored, noisy respiration, anoxemia is slowly and steadily developing. Thus, a tracheotomy, which relieves the anoxemia, also reduces the cerebral edema.

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## MODERN ADVANCES IN DIABETES MELLITUS

FRANK W. PICKELL, M. D.

BATON ROUGE

We, as practitioners, realize today that there are more diabetics to treat, since 4 per cent or more of our present population has now, or is destined to develop the diabetic state, three fourths of them after the age of 50. We also realize that no longer should we assume that they work out their destiny alone, or just with the help of insulin. We believe that they should be aggressively and rigidly regulated, as the patients who most closely control their disease are freer of complications and live longer. The increase in life expectancy, of less than three years in the juvenile diabetic in pre-insulin days to over forty years now, should

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Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.



be transmitted to the much more numerous middle aged and elderly diabetics who recent statistics have shown have had an increase in life expectancy of only three to four years since the advent of insulin.

Our purpose in this paper shall be to discuss some of the more recent ideas about the physiological upset in diabetes mellitus and then some of the newer and more refined methods in its management. We believe better diabetic treatment is achieved by knowing all new advances and then with caution adapting them to our patients.

Though there continue two schools of thought concerning the nature of the disturbance in carbohydrate metabolism in diabetes mellitus, more and more evidence accumulates to emphasize that under-utilization of glucose constitutes the basic disturbance and that the glands of internal secretion and the liver are also intimately involved. Figure 1 represents very diagrammatically normal carbohydrate metabolism. The blood glucose may be pictured as arising from three types of processes. The first of these is the absorption of glucose across the intestinal mucosa from the diet. A second source, termed glycogenolysis, is from the breakdown of glycogen in the liver. This process has been clarified by the Coris of St. Louis, who have shown that the initial process is one of phosphorylisis, and that its reaction product glucose-1-phosphate is readily transformed in the body to glucose-6-phosphate, and that these two reactions apparently occur wherever one finds glycogen. The next reaction glucose-6-phosphate phosphatase glucose + inorganic phosphate is, in the mammal, more or less peculiar to the liver, although it can undoubtedly occur in other tissues.<sup>10</sup> The lack of phosphatase in muscle is the reason muscle glycogen is not available as a direct source of blood glucose.

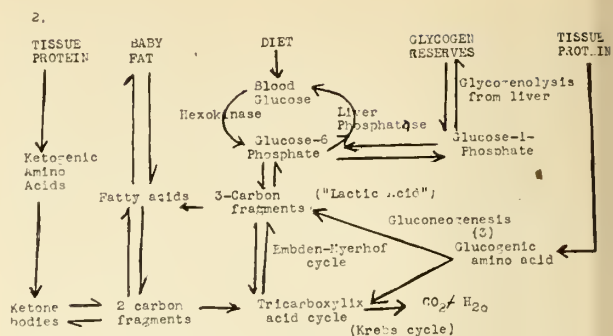


Fig. 1. Origin and fates of body glucose.

Reaction 1. Glucose-6-Phosphate Phosphatase, Glucose inorganic phosphate.

Reaction 2. Glucose Adenosine Triphosphate Hexokinase, Glucose-6-phosphate Adenosine diphosphate.

A third source of blood glucose is gluconeogenesis from noncarbohydrate precursors in certain amino-acids, fatty acids, glycerol, and fragments resulting from the breakdown of glucose itself. The relative amount arising from each source in man is unknown, but in experimental animals 3 per cent from glycogen of the liver and 30 per cent from smaller fragments was shown to be contributed as compared to that ingested from diet. Glucose, thus, arises more or less continuously and all of it must be disposed of. It must first be phosphorylated, and the enzyme hexokinase is necessary for this reaction, which very likely occurs at the cell membrane. After this more or less obligatory first reaction, the product glucose-6-phosphate, as you see in Figure 1, is exposed to many possible fates. It may be converted to fatty acid, or it may be transformed to the glycogen stores, or finally, it may be oxidized. The amount going in each direction in man, again is all unknown, but in the experimental animal, the rat, 3 per cent of all glucose made or ingested went to glycogen and 30 per cent to fatty acids, and the remainder was metabolized to <sup>8, 10</sup> CO<sub>2</sub> and other products not shown in Figure 1. If this reaction is going normally, one would find normal amounts of glucose converted to CO<sub>2</sub>, to glycogen, and to fatty acids each day. Figure 2 indicates the possible magnitude of this, by the thickness of the ar-

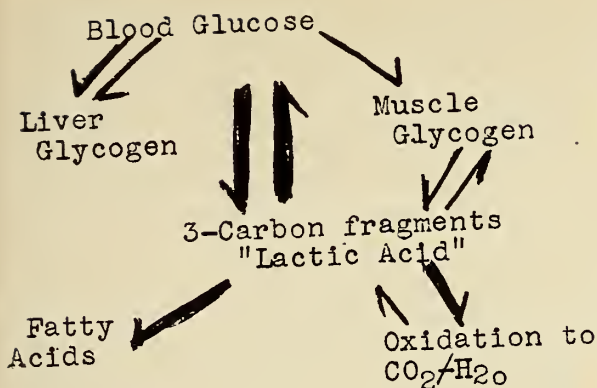


Fig. 2  
Normal

rows. In this reaction, in which the abundant enzyme hexokinase is inhibited, one would predict a retardation in all the various modes of utilization of glucose, and it would appear at the present time that this is the situation in the diabetic individual<sup>8, 10</sup>. This situation in diabetes is shown in Figure 3, which should be compared to Figure 2, remembering that the thickness of the

and the blood sugar level remains at the normal level of about 100 mgm. per cent. This assigns insulin a satisfactory position as a rate determiner in carbohydrate metabolism. Its over-all effect in magnitude

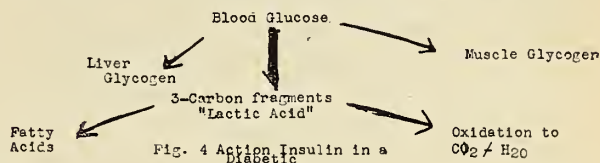


Fig. 4 Action of Insulin in a Diabetic

in a diabetic is shown in Figure 4 by the thickness of the arrows. Also it aids indirectly in the synthesis of certain amino-acids used in the elaboration of body protein<sup>10</sup>.

A brief look now at the new ideas of the influence of some of the glands of internal secretion on carbohydrate metabolism. The adrenal gland is important. We all know that epinephrine characteristically raises the blood sugar by increasing the breakdown of liver glycogen and later decreases muscle glycogen which breaks down to lactic acid to be transported to the liver for synthesis into glucose or glycogen. Cori suggests that some adrenal steroids exert their "anti-insulin" effect primarily by intensifying the inhibitory action of A. P. E. upon hexokinase<sup>8</sup>. More recently an S-Hormone (sugar hormone) of the adrenal cortex is believed to direct conversion of protein to glucose. This will explain the development of diabetes after moments of chronic stress and also perhaps explains the glycosuria following coronary thrombosis and after emotional upheavals.

Hyperthyroidism in a diabetic has a worsening effect. The thyroid hormone probably acts similarly to the anterior pituitary. Hypothyroidism causes the diabetic state to become much milder.

The pancreas now deserves a word. Over two decades ago, after Banting and Best isolated insulin and firmly established that it was elaborated by the beta cells of its islands of Langerhans and showed it corrected all the obvious defects of carbohydrate metabolism in pancreatectomized dogs and human beings with diabetes mellitus, a simple hypothesis seemed to explain dia-

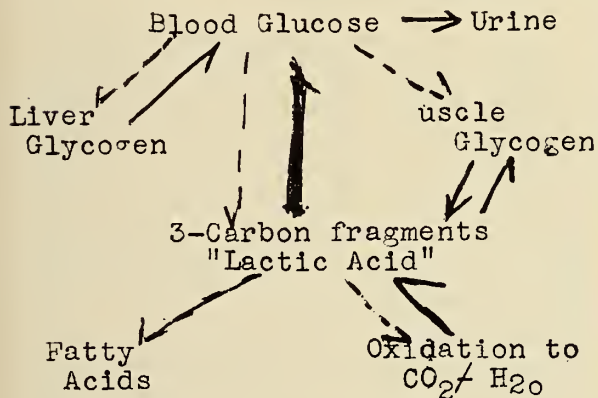


Fig. 3 Diabetes Mellitus

arrows shows the possible magnitude of the reaction. The Coris have shown a specific inhibitor to this reaction can be isolated from the anterior pituitary gland and that its action can be prolonged by certain of the oxygenated adrenocortical steroids. But perhaps their most important discovery was their demonstration that this inhibition of the hexokinase reaction by a specific inhibitor of the anterior pituitary gland is completely abolished by insulin. Normally, a proper balance is maintained



betes mellitus, but Houssay of Buenos Aires, in 1930, with some startling experiments shook our complacency and gave impressive support to earlier clinical observations in a variety of endocrine disorders that in the pancreas was not the primary cause of diabetes mellitus. This investigator demonstrated that if the anterior pituitary were removed before or after the pancreatectomy, the diabetes resulting was very mild. A similar ameliorating influence was demonstrated by Lukens to follow adrenalectomy in the pancreatectomized cat. Four reported human cases of the Houssay phenomenon and sixteen cases of coincidence of diabetes and Addison's disease<sup>11</sup> corroborate this experimental work. A recent reported case<sup>9</sup> of total pancreatectomy in a patient with diabetes showed no change in an insulin requirement of about 40 units daily.

Now a word about ketosis. No longer do we say that "fat burns in the flame of carbohydrate" and no longer do we consider fat metabolism any different, qualitatively, in the diabetic. Referring to Figures 1 and 3, let us consider what happens when a diabetic is given a large amount of carbohydrate. This ordinarily should be stored in the liver, but is not, and when glycogen storage is insufficient, then fatty acid production is greatly increased, above what the muscles and tissues can utilize. Here is the reason: At all times there is a constant competition between the fatty acids and stored glycogen for a single enzyme system. Glycogen gets the preference but when it fails fatty acids are metabolized in still more excess. Their accumulation in the blood causes a disturbance in acid base balance and produces an intoxication that is ketosis and it plays a considerable part in the picture of diabetic coma.

The factor of obesity in diabetes is important, as more than 50 per cent of diabetics are obese and a majority of the older age diabetic patients lose evidence of a disturbance in carbohydrate metabolism with a reduction in weight. Allen found that in partially pancreatectomized dogs, showing no evidence of experimental diabetes, a di-

abetic state could be produced by overfeeding, and after withdrawal of too much food they would return to a normal state.

A family history of diabetes can be obtained in at least 25 per cent of diabetics. In identical twins the evidence of diabetes is 70 per cent in contrast to 10 per cent in twins derived from separate ova. Genetic studies by Joslin and others, strongly suggest that diabetes is inherited as a mendelian recessive trait. A new fourth method for producing diabetes in the experimental animals has been added to the now classical ones of:

1. Pancreatectomy, total or partial with overfeeding.
2. Injection of large amounts of A P E (or in suitably prepared animals, of adrenal cortex or thyroid).
3. Injection of alloxin.

This new method was accomplished by producing a state of hyperglycemia for two weeks in a cat by administering glucose solution intraperitoneally.<sup>1</sup>

The commonest pathological lesions in diabetes mellitus are found in the pancreas, but they are inconstant and absent entirely in 10 per cent of large series autopsied<sup>8</sup>. Inter-capillary glomerulosclerosis was found in 44 per cent of diabetic autopsies in one series<sup>8</sup> but only 19.5 per cent in another at Mayo Clinic<sup>13</sup>. Arteriosclerotic lesions are extraordinarily prevalent in patients with diabetes, even in children, as in 50 per cent of children who have had the disease fifteen years, x-ray will show calcification of the arteries. A recent study of 50 autopsied diabetic hearts in Boston, showed 75 per cent had significant coronary artery disease of the arteriosclerotic type.<sup>12</sup>

Adequate diabetic treatment aims in general to maintain the patient in a state of well being so that he will avoid complications and degenerative diseases, as evidenced by progressive loss of vision, gangrene, or flagging heart, which may suddenly appear ten or twenty years hence. In all these complications there is just one single common finding—hyperglycemia,—

so the greatest need in the prevention of later diabetic degenerative disease is good control of hyperglycemia at its onset and thereafter. First the diabetic should be put on a satisfying and satisfactory diet and instructed in its adjustment.

A SAMPLE DIET (STANDARD)<sup>15</sup>

TABLE 1

WITH USUAL CALCULATIONS THAT SHOULD BE TAUGHT

	C	P	F
Breakfast:			
Fruit—10%—1 portion	10	1	0
Cereal—½ cup cooked or 2/3 cup dry	20	4	0
Eggs, 2	....	12	12
Bacon, 3 strips crisp	....	8	16
Bread, 1 slice or 2 biscuits	16	3	....
Butter, 1 pat	....	....	7
Milk, ½ cup	4	2	3
Coffee or Tea	....	....	....
	50	30	40
Lunch:			
Meat, Fish, Fowl, Cheese, average portion	....	18	13
5% vegetables as many as desired	5	1	1
10% vegetables 4-6 rounded tablespoons or 20% vegetables 2-3 rounded table-spoons	10	2	....
Bread, 1 slice	16	3	....
Butter	....	....	7
Fruit 10%	10	1	....
Coffee or Tea	....	....	....
	40	25	20
Dinner same as lunch	40	25	20
Total grams	130	80	80
@	x4	x4	x9
Calories	520	320	720
Total calories			1560
To above may be added:			
3 slices bread	48	9	....
3 glasses milk	36	12	18
Total grams	84	21	18
	x4	x4	x9
	336	84	162
Total Calories			582

After the patient has been on such a standard diet for a week, then think of insulin if there is still glycosuria.

Instruct the diabetic to examine the urine for sugar four times daily, 7 A. M., 11 A. M., 5 P. M., and 9 P. M.; that is, before each meal and at bedtime. The early A. M. test reflects the fasting state overnight or the

fasting state plus the effects of protamine zinc insulin, if it is being used. The latter three tests reflect the previous meal and its utilization, plus exercise, plus effects of whatever insulin used. The patient should keep a record in a notebook, that can be easily analyzed and the following simple tabular scheme, I find best:

TABLE 2

	7 A.M.	11 A.M.	5 P.M.	9 P.M.	Remarks
Monday	Blue	Green	Blue	Green	
Tuesday	Green	Blue	Blue	Blue	
Wednesday	Blue	Orange	Green	Green	
Thursday	Green	Blue	Green	Blue	
Friday					
Saturday					
Sunday					
Monday					
The color of the sugar test should be written down each time. Use Benedict's solution or Clinitest.					

If glycosuria is present, regular insulin twice a day before breakfast and before supper may first be tried, divided as follows: 12 before breakfast and 8 before supper or 16 before breakfast and 10 before supper. This should be gradually increased until the four specimens of urine are sugar free. An alternative start may be made with 10 to 20 or up to 40 units of protamine zinc insulin, daily half hour before breakfast, testing the urine at the same four times and increasing the minimum starting dose until the urine is sugar free.

A great majority of the milder cases may be successfully kept sugar free on the protamine zinc insulin, but these are largely in the older age groups. The objection to protamine zinc insulin is that that it may cause hypoglycemic shock during exercise or during the early hours of the morning. Right now let us look at Table 3<sup>16</sup>, and get fixed in our minds the time activity of a single large dose of the various types of insulin, in a moderately severe diabetic, for these are the overwhelming majority of the ones we want to improve the treatment for:



TABLE 3

Type of Insulin	Action Demonstrable in	Peak Action in	Intensity at peak	Duration of Effect:
Regular or Crystalline Insulin	1 hour	3-6 hours	Strong	8-12 hours
Globin	2 hours	8-12 hours	Fairly Strong	24 hours at most
2:1 mixed of regular and P Z I	4 hours	12-16 hours	Moderate	1 ½-2 days
P Z I	4-8 hours	24-32 hours	Weak	3 or more days

Regular or crystalline insulin is used in the following cases:

1. Emergency infection.
  2. To supplement before each meal the "depot" insulin given before breakfast.
  3. In the rare cases of high insulin requirement of 150 units or more.
  4. To get better control in some cases.
- Globin insulin tends to give late afternoon hypoglycemic shock and glycosuria at night and we consider it unsatisfactory for any but the mildest cases and in these cases protamine zinc insulin is much preferred because of its overlapping action.

Protamine zinc insulin is the best insulin in mild and moderately severe diabetics and gives best regulation in the patient whose fasting blood sugar before breakfast is high and the post-cibal "peak" blood sugar is not high. Vice versa of these blood sugars would be the very rare indication for globin insulin.

If the Protamine Zinc Insulin must be so greatly increased to control the blood sugar level during the day that it excessively reduces the early A. M. sugar level and causes hypoglycemic shock then, or globin insulin must be given in such large doses to control the early A. M. hyperglycemia that it causes late afternoon hypoglycemic shock, then we must turn to the so-called mixed insulin given as a single dose before breakfast. This is a mixture prepared from regular insulin mixed with protamine zinc insulin always of the same concentration in units, in ratio of about 2 to 1. This insulin has an intermediate action (as you can see from table 1) between globin and protamine zinc insulin. We do not use this mix-

ture in the old person or young child (unless the child is of the bookworm type and does not exercise much). It is the choice of insulin for moderate to severe diabetics between the ages of 18 years and 50 years, and may be used after the age of 50 years, if there is no evidence of cardiovascular disease<sup>12, 15</sup>, and it should be borne in mind that any poorly controlled diabetic of 10 years or more duration usually already has cardiovascular disease even though they have no symptoms of such.

In this changeover from regular or protamine zinc insulin to 2:1 mixed insulin, the total dose in units is reduced one third at start of the replacement; then if daytime glycosuria and hyperglycemia persist, the regular insulin content of the mixture is increased: e. g., making the ratio 2½:1 or 3:1. If the postabsorptive or fasting glycosemia and hyperglycemia persist after this changeover, then increase the protamine zinc insulin content of this mixture, e. g., making ratio 1½:1 or 1:1. Thus it is seen that the criteria for the adjustment of each component is identical with those criteria governing each component used alone.

An alternative method of starting the use of 2:1 mixed insulin, and one that will probably be used most in office or outpatient department patients, after starting the diet and four urinalyses daily, is to put them on a total of 9 to 21 units of a 2:1 mixture given before breakfast, and then revise this up or down depending on the response.

In the use of mixed insulin, the carbohydrate of the diet should be divided equally among the three meals. The great advan-

tage of mixed insulins is the avoidance of wide swings in the blood sugar level and control of the glycosuria.

When acute complications, such as an acute febrile illness, develop in a diabetic it is best to divide the diet and insulin (using only regular or crystalline insulin) into four or six equal amounts regularly spaced in the twenty-four hours of the day. Urine should be tested every four hours and insulin adjusted and given before each feeding; for example, in mild diabetics give 1500 or more calories, with plenty of fluids divided into six feedings, with six units given before each feeding, and decrease or increase this amount of regular insulin according to the four hour urine reactions.

Severe diabetic acidosis is best treated immediately and intensively in the hospital as it requires coordinated medical, nursing and laboratory efforts. Hypoglycemic reactions are likely to occur in any patient treated with insulin. They may be severe and even fatal. They occur: (1) Late at night or early in A. M. or during heavy exercise when protamine zinc insulin is used. (2) Late in P. M. if globin is used. (3) One or two hours after regular or crystalline insulin is given. This may occur in any patient taking insulin, and the diagnosis must be considered if there is a blood sugar below 70 mgm. per cent, though symptoms of shock often do not appear until the blood sugar is 40 mgm. per cent or below. The symptoms though variable follow a reproducible pattern in each individual. A blood sugar of 50-70 mgm. per cent gives nervousness, sweating, excitation, tremor, hunger, and, if uncontrolled, convulsions and coma; if 40 mgm. per cent or below weakness, headache, nausea, depression and convulsions.

It appears that the brain is involved from the cerebral cortex downwards and that there is a reduction of oxygen consumption hence from 6.8 vol. per cent to 2.57 to 1.77 and this is probably the cause of the symptom complex.<sup>4</sup> The following is a step by step outline of symptoms and signs of each progressive step in involvement of

the brain cerebral cortex and cerebellum: Somnolence, sweating, salivation, tremors, excitement and confusion. Then thalamus: Sympathetic nervous stimulation, dilated pupils, tachycardia, flushing. The mid-brain: Reaction to stimulant resulting in tonic spasm and a positive Babinski sign, and finally involvement of the medulla oblongata. Increased parasympathetic activity: Pin point pupils—nonreactive to light, slow heartbeat, slowing of respiration, relaxation of muscles and the loss of corneal reflex. Of course, use glucose before this develops, but if this state is present also give barbiturate to control muscular contractions.

Pregnancy complicating diabetes is influenced most by an imbalance of sex hormones as Priscilla White of Boston has pointed out most conclusively. In the pregnant diabetic, high fetal mortality, pre-eclampsia and obstetrical abnormalities parallel an abnormal pattern of sex hormones. What should be a practical and up-to-date management of pregnancy in diabetes mellitus? First, pregnancy should be advised against in the diabetic over thirty years of age, or in diabetics of twenty-five years duration, as maternal morbidity is certain and maternal survival a gamble.

If already pregnant, or we allow pregnancy, a strict regime including chemical management is carried out. This includes restriction of salt and sodium bicarbonate intake, a high protein diet, 60-120 grains of ammonium chloride daily if the patient has edema, and substitutional estrogen and progesterone therapy. If a diabetic pregnant patient presents a history of an obstetrical accident, or upon appraisal appears to have hypogonadal stigmata, such as periods of amenorrhea, menorrhagia, chronic cystic mastitis, edema, or if weekly hormone analyses show a fall in serum level of estrogen, lowered excretion of pregnandiol glycuronate and compensatory rise in serum chorionic gonadotropin, hormone therapy



is indicated. The dosage of stilbesterol and progesterone in such cases, is as follows:

Up to 20th week: 5 mgm. daily  
 20-24th week: 10 mgm. daily  
 24-28th week: 15 mgm. daily  
 28-32nd week: 20 mgm. daily  
 32-36th week: 25 mgm. daily  
 36-delivery: 30 mgm. daily.

Premature delivery at the end of the thirty-seventh week is advocated; two thirds will

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TABLE 4

Diabetic Pregnancies in which	No. Cases	Maternal survival	Fetal survival	Pre-edempsia	Premature Deliveries
Hormone balance normal	66	100 %	97 %	2 %	0
Hormone balance abnormal	58	100 %	47 %	50 %	40 %
Hormone balance abnormal but estrogen and progesterone supplied	174	99.5 % *	90 %	5 %	5 %

\* One maternal death in this group due to infectious hepatitis.

require Cesarean section, under spinal anesthesia without preliminary sedation. If normal delivery occurs, medication should be kept to a minimum. Special care is required for the infant and to guard against atelectasis, and includes use of oxygen and insurance of its delivery to the baby's lungs.

Priscilla White in Boston reports three groups of cases that are convincing for the results obtained by hormone therapy.

Simple matters as proper care of feet, hands, and skin often prevent gangrene in A S diabetics. They should be instructed in these, by their physician. Exercise in moderation should be allowed, as it increases carbohydrate tolerance. Over fatigue, both mental and physical, and worry should be avoided, as they decrease carbohydrate tolerance and predispose to infection.

We have presented, as we see them, some of the more recent advances in pathological physiology, and in the more exact treatment of diabetes mellitus. We hope it will spur you on to a more aggressive attack on this problem, especially in your middle-aged and pregnant diabetics.

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## AN EVALUATION OF THE USE OF VARIOUS INSULIN PREPARATIONS IN DIABETES MELLITUS

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NEW ORLEANS

The discovery of insulin marked a tremendous advance in the treatment of diabetes mellitus. Amorphous insulin is not

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entirely satisfactory in the control of human diabetes mellitus. Various modifications of the original product have been used in an endeavor to convert the diabetic into a more normal organism.

Because of the difficulties encountered in the use of insulin and its various modifications, two schools of treatment have arisen. The one, headed by Tolstoi<sup>1, 2</sup>, relaxes the standards of control considerably in severe cases and philosophically tolerates pronounced glycosuria provided ketosis, loss of weight, increased thirst and polyuria are absent. It is Tolstoi's contention that the amount of carbohydrate utilized is vastly more important than the amount of sugar excreted in the urine. The other group attempts to adapt the patient to his insulin by altering the distribution of the carbohydrate and protein in meals, by supplementary feedings through the 24 hour period, by the administration of one or more types of insulin in several injections daily, etc. Dietary juggling is tedious; it necessitates a reasonable familiarity with dietary principles, complicates the usual hospital routine and may require alterations of the food habits of patients. Multiple feedings and injections are hardly conducive to a "normal" existence.

The question to be answered is: Is it necessary, or even desirable, to avoid hyperglycemia and glycosuria? While it is not universally accepted that lax control of the disease is responsible for the degenerative complications which characterize it, there is suggestive evidence<sup>3</sup> both in animals and man that this may be the case. In the absence of proof to the contrary, it may be hazardous to abandon the goal of normoglycemia in the treatment of diabetic patients.

The search for an "ideal" insulin preparation continues. Its requirements have been outlined by Colwell,<sup>4</sup> "On purely theoretical grounds, the ideal insulin is one whose solubility and rate of insulin release is such that it acts promptly and intensely enough to control the glycosuria following meals, but does not cause hypoglycemia between meals. It must act long enough to

control nocturnal hyperglycemia but also wane rapidly enough to avoid nocturnal hypoglycemia. It should possess the greatest possible constancy of action from dose to dose without sacrificing prolongation of effect." Although such an insulin preparation has not been produced as yet, encouraging progress has been made toward this goal.

The purpose of this paper is to present the characteristics of the various insulins at our disposal and the results of treatment in order to evaluate their advantages, as well as their shortcomings, in diabetic therapy. This should serve to facilitate and simplify the management of these patients.

Four types of insulin have become available for the routine treatment of diabetes mellitus. These are: (1) unmodified insulin, (2) protamine zinc insulin, (3) globin insulin with zinc, and (4) mixtures of regular and protamine zinc insulin and modifications of protamine zinc insulin.

#### 1. UNMODIFIED INSULIN

This is the true hormone as discovered by Best and Banting in 1921, and crystallized by Abel in 1925. All other insulins in use today stem from this substance which has been altered in one way or another to produce prolongation of effect although the essentials of its action on carbohydrate metabolism are unaltered.

Insulin is an amphoteric substance. It has an isoelectric point at which it exhibits minimum solubility. (pH6.0-6.2). Beyond that point it is readily soluble. A crystalline insulin has been produced whose solubility is complete only at a pH greater than 6.4. Its proposed advantages<sup>5-7</sup> may be stated in these simple terms: An insulin of greater alkalinity is absorbed more slowly by the tissues and the blood, and this in turn slows down the glycolytic effect of the insulin molecule. That the slight prolongation of effect is not entirely attributable to increased zinc content has been shown by Altschuler and Leiser.<sup>8</sup>

Marble and Vartiainen<sup>9</sup>, in a series of experiments, obtained blood sugar curves which showed the effect of zinc insulin crystals to be almost identical with amor-



phous (regular) insulin. In fasting diabetic subjects, the action of crystalline insulin was slightly prolonged, producing a slightly longer blood sugar lowering effect than can be obtained with amorphous insulin. The lowest point in the curve following a single injection is reached in 6 hours with amorphous (regular) and in 7 hours with crystalline insulin. Duration of action was 9.6 hours for the amorphous and 11.2 hours for the crystalline insulin. On maintenance doses, however, the differences were of such slight degree as to be of minor clinical significance. In such cases there was demonstrable effect within 1 hour with peak action between the third and sixth hour and an effect which was demonstrable for 8 to 12 hours.

*Advantages:* Because of its solubility, unmodified insulin acts most briefly but is the most prompt and intense of the insulins and exhibits greatest uniformity of effect. For these reasons, unmodified insulin is the preparation of choice in emergencies where these qualities of action are mandatory, e.g. in acidosis, infections, following trauma, and preoperatively and postoperatively. It is useful in supplementing protamine insulin effects when indicated. It is also indicated in those cases in which control is impossible with one of the types of protamine insulin.

*Disadvantages:* These include short duration of action which necessitates injections every four to six hours throughout each twenty-four hour period. However, as emphasized by Joslin,<sup>11</sup> this is not its only drawback. As a matter of fact, at least for half of its effective period, it is overactive and underactive because a preliminary time is required for it to exert an adequate effect and later hypoglycemia can easily result. In other words, there are alternating periods of hyperglycemia and hypoglycemia throughout each twenty-four hour period.

An occasional disadvantage of amorphous (regular) insulin, is the occurrence of allergic reactions associated with contaminating proteins. These reactions may be

avoided by the use of the purer crystalline insulin.

## 2. PROTAMINE INSULIN

Hagedorn and his co-workers<sup>12, 13</sup> at the Steno Memorial Clinic in Copenhagen conceived the idea that if insulin could be combined with some basic group so that the pH of the combination would be nearer the pH of tissue fluid, then absorption might be slowed. In this compound, insulin acts as an acid, whereas in insulin hydrochloride it acts as a base. For his purpose, he resorted to the protamines, and the most suitable of these proved to be that derived from the sperm of rainbow trout. This combination alone was insufficient to delay absorption but when the reaction of the solution was adjusted to a pH of 7.2, which is similar to that of tissue fluid, a precipitation of protamine insulin took place. As the result of the compound being a suspension, the deposit in the subcutaneous tissue consisted of (1) a fluid of practically constant insulin concentration from which absorption takes place and (2) a steadily diminishing amount of solid particles. In other words, the compound was slowly broken down and active insulin released over a relatively long period of time thus allowing for a more even and prolonged effect on the blood sugar.

*Clinical Use:* This insulin was subjected to extensive clinical trial by numerous competent observers<sup>14-19</sup> who confirmed the results of Hagedorn. The duration of action of a given dose is approximately fourteen hours. Thus a single daily dose is sufficient for adequate control in many cases. In those diabetics not satisfactorily controlled by a single daily injection, Hagedorn<sup>12, 13</sup> found that the administration of regular insulin each morning before breakfast and the injection of protamine insulin before retiring insured much more adequate control. The purpose of this regime was to prevent hyperglycemia and glycosuria from occurring in the forenoon because of the slower action of the newer insulin and, at the same time, to satisfactorily control nocturnal hyperglycemia. Similar results were

obtained by Joslin and his group,<sup>14, 15</sup> Lawrence and others.<sup>16</sup>

Certain dietary adjustments were necessary to obtain the most satisfactory results with this insulin. As stressed by Campbell,<sup>17</sup> diets very high in carbohydrate and low in fat are less suitable than diets high in fat and low in carbohydrate. Joslin<sup>14, 15</sup> divides the total carbohydrate of the diet into two-fifths for breakfast and lunch and one-fifth for supper, in order to more readily control the blood sugar after the evening meal.

*Advantages:* These include (1) prolonged action which insures better control with fewer injections and (2) reduced liability to hypoglycemia because of its slower and less violent action. "Whereas the Banting era made possible the conquest of coma, the Hagedorn era makes possible the physiological processes of the diabetic to be more nearly normal." (Joslin<sup>15</sup>).

*Disadvantages:* These include (1) instability of the protamine compound if kept for more than three or four weeks; (2) because the preparation is a suspension, thorough mixing is essential in order to assure identical dose measurements; (3) its *inability* to adequately control the marked hyperglycemia and glycosuria following high carbohydrate meals. In other words, rapidity of onset, intensity of effect, and constancy are sacrificed for duration of effect as compared with unmodified insulin; (4) dietary rearrangement with its various disadvantages is essential for best results; (5) because of its peculiarities of action, this insulin is not advisable in situations in which immediate and intense insulin effect is desired.

### 3. PROTAMINE ZINC INSULIN

The discoverer of this insulin is Scott<sup>20</sup> of Toronto, who showed that crystalline insulin is a true chemical compound of zinc and insulin-zinc insulinate. When he turned his attention to protamine insulin compounds he found that when entirely freed from zinc and traces of allied metals, they were more prolonged in their action than soluble insulin hydrochloride. The addition of traces of zinc and adjustment of

the pH to 7.2 produced a zinc protamine-insulin compound in suspension which was more stable and more prolonged in its action than any previously discovered. Extensive clinical study by Rabinowitch and his group<sup>21</sup> served to support Scott's claims. As suggested by Bang,<sup>22</sup> zinc delayed and prolonged the rate of insulin release beyond that observed by Hagedorn, possibly by inhibiting an enzymatic process responsible for the separation of insulin from its precipitating protein in tissue fluid.

*Chemistry:* Protamine zinc insulin is a cloudy suspension which contains 0.75 to 1.25 mgm. of protamine and 0.2 mgm. of zinc per 100 units of insulin buffered to a pH of 7.2. Standard protamine zinc insulin contains an excess of 40 per cent protamine. This is because precipitation is not complete. In order to precipitate practically all of the small amount of insulin remaining in solution and to place the solubility of the combination well beyond the point where minor variations may result in significant alteration of the rate of activity, it was decided to follow Hagedorn's advice and include excess protamine. This excess also has the effect of combining with the tissue proteins about the depot of injection thereby delaying absorption still further and increasing the prolonged action of the product (Peck<sup>23</sup>).

*Time Activity:* Careful studies of the time activity of protamine zinc insulin have been carried out by Eastman and Greeley<sup>24</sup> and Martin and Greeley.<sup>25</sup> Time activity curves obtained following the administration of 50 units of protamine zinc insulin to a depancreatized dog revealed the following: The onset of activity is slow being demonstrable in three to four hours; a delayed peak of activity occurred between seventeen and twenty-four hours following the administration of insulin, and the duration of action is approximately seventy-two hours. This curve is similar in general to a curve following the administration of 100 units of protamine zinc insulin to a severe, fasting diabetic.

As regards the duration of action and activity of different size doses of protamine



zinc insulin, several conclusions were reached by these observers: (1) There is a difference in duration of action of a given dose of protamine zinc insulin—in the mild diabetic with no basal insulin requirement the duration is longer than in the severe diabetic with a basal insulin requirement. (2) There is a period of maximum activity with all size doses of protamine zinc insulin and this period is delayed with the larger doses; and (3) it is important to give protamine zinc insulin to the severe diabetic properly timed in relation to the period when maximum insulin effect is desired.

The latter observations have been challenged by Ricketts<sup>26</sup> in an interesting study. Eight severe, well controlled diabetics were given their calculated diets daily and prescribed dosage of protamine zinc insulin daily at 7:30 A. M. Composite curves were obtained by examination of the blood sugar at regular intervals. After a suitable rest period, protamine zinc insulin was given at 8:00 P. M. and composite blood sugar curves were obtained. In 3 patients studied, the administration of protamine zinc insulin in the evening resulted in blood sugar curves practically identical with those observed during the morning period. In 4 of the remaining 5 patients, the differences between the morning and evening curves were slight, and since they did not lie consistently in one direction are probably to be explained on the basis of variations in the state of the diabetes from one week to another rather than by the superiority of one regime over another. This constancy of action of protamine zinc insulin holds several practical and theoretical implications: (1) It means that this form of insulin should not be regarded as having a period of maximum effectiveness. While it lowers the blood sugar to a minimum in twelve to eighteen hours, when given as a single dose to patients not receiving food, it furnishes a continuous and relatively even supply of insulin from the subcutaneous depots when used in the day-by-day treatment of diabetes. Its action, once fully established, is maximal at all times.

The patient, therefore, can take his injections at whatever time of day it is most convenient, provided that they are twenty-four hours apart. (2) If nocturnal hypoglycemia occurs, it is not because of any greater insulin action at this time but because the amount is so large as to render the basic level too low. (3) It controls the mild case of diabetes admirably but in the severe case, even though it may render and maintain the blood sugar normal during fasting, it does not completely prevent hyperglycemia after a mixed meal. This would suggest that the chief function of protamine zinc insulin is in the regulation of endogenous carbohydrate metabolism.

Since a given dose of protamine zinc insulin exerts some effect for as long as seventy-two hours, changes in the dose administered should not be any more frequent than every third or fourth day.

*Use:* Protamine zinc insulin has been subjected to widespread clinical trial and critical analysis by numerous competent observers.<sup>1, 2, 27, 47</sup> It has become increasingly obvious that this insulin has become invaluable as a means of providing sustained insulin effect with one daily dose. Mild diabetics, i.e. those who require 40 units or less of insulin daily, are readily controlled, whereas a larger percentage of severe diabetics are not well controlled with a single daily injection of protamine zinc insulin. Even in severe diabetes, however, control is vastly superior to that obtained with multiple daily injections of regular insulin. Response to this type of insulin therapy is much more gratifying if the diet contains no more than 150 Grams of carbohydrate daily. In order to assure maximum efficiency with protamine zinc insulin, the total carbohydrate of the diet is best divided into one-fifth, two-fifths and two-fifths, for breakfast, lunch, and supper, respectively, with a glass of milk and a slice of bread, or one or two crackers, reserved for a bedtime snack.

*Advantages:* These include: (1) Slow and persistent insulin action over a twenty-four hour period making it possible for a mild diabetic to metabolize his carbohy-

drate in a normal fashion throughout this period. (2) The fact that the action of protamine zinc insulin is exerted over a period longer than twenty-four hours enables the patient to begin his day with a normal blood sugar. This is what Joslin terms as "insulin insurance from one day to the next." (3) Because of its characteristics of action, diabetic coma is inexcusable in all but a small fraction of patients. (4) The compound is quite stable.

*Disadvantages:* (1) Protamine zinc insulin provides a constant small amount of circulating insulin sufficient to control endogenous carbohydrate metabolism but too weak to control the blood sugar after high carbohydrate meals. Increasing the dose of protamine zinc insulin to control postprandial hyperglycemia will result in unpleasant, and often dangerous, nocturnal hypoglycemia. (2) Dietary readjustment, with its various trials and tribulations, is essential for best results. (3) Hypoglycemic reactions with protamine zinc insulin are mild and gradual in onset and are definitely more difficult to detect and treat. The fact that these reactions are more prone to occur after the patient has retired adds to the hazard. Insulin reactions with protamine zinc insulin occur at much lower blood sugar levels than with regular insulin. This is possibly because the drop in blood sugar level is so gradual that the adrenals and sympathetic nervous system are not stimulated to secrete adrenalin and promote mobilization of liver glycogen. It should also be borne in mind that whereas tremor and perspiration are the most common symptoms of a "reaction" from regular insulin, patients receiving protamine zinc insulin most often complain of headache, usually occipital, nausea, and vomiting. These symptoms may persist for hours and interfere greatly with the intake of food. These are often symptoms of acidosis, and care must be exercised in differentiating between the two states. (4) The sudden onset of any condition preventing the intake of food following the daily injection of protamine zinc insulin is another disadvantage of its slow and pro-

longed action. (5) This is not the insulin to be used in diabetic emergencies where rapid and intense insulin effect is desired. (6) Local allergic reactions are not infrequent and are, at times, annoying. (7) A certain minor disadvantage is the fact that since protamine zinc insulin is a suspension, the vial must be carefully and gently shaken before the withdrawal of each dose to insure a uniform dose.

As in the case of protamine insulin, protamine *zinc* insulin has sacrificed rapidity and intensity of action and constancy of effect for prolongation of activity. Obviously, a certain number of cases will be poorly controlled on protamine zinc insulin.

#### 4. GLOBIN INSULIN WITH ZINC

Since the introduction of slowly acting protamine zinc insulin in 1937, many attempts have been made to modify and improve its action. These investigations have been stimulated primarily by the recognition that one-third to one-half of the patients using protamine zinc insulin require a supplementary injection of unmodified insulin to insure a satisfactory blood sugar during the earliest part of the day. This has been necessitated by the lack of "rapid, early effect" of protamine zinc insulin.

The first attempt to improve on protamine zinc insulin without sacrificing its obvious advantage of sustained action was the introduction in 1939 of globin insulin. The preparation was developed by Reiner, Searle and Lang<sup>48</sup> and studied clinically by Bauman,<sup>49-51</sup> Andrews and Grant,<sup>52</sup> Duncan and Barnes,<sup>53</sup> Bailey and Marble<sup>54</sup> and others.<sup>55-62</sup>

*Chemistry:* According to Reiner, Searle, and Lang,<sup>48</sup> when insulin was mixed with globin derived from beef hemoglobin, the solution remained clear at a pH of 4 or less and precipitated between pH 5 and 8. When 0.2-0.3 mgm. of zinc was added to a preparation containing 3.8 mgm. of globin per 100 units of insulin, the duration of hypoglycemia was more than twice that obtained with amorphous insulin containing the same amount of zinc.

At the present time, globin insulin with



zinc as manufactured commercially is a clear, colorless solution with a pH of 3.7 and composed of 3.04 mgm. of globin and 0.24 mgm. of zinc per 100 units of insulin.

**Action:** Careful studies of the time activity of globin with zinc were carried out by Martin, Simonsen, and Homann.<sup>58</sup> These revealed that the onset of action of globin insulin occurred within one to two hours after injection with its peak occurring between the fifth and tenth hours. Action is apparent for eighteen to twenty hours although the action of globin insulin is not marked beyond the fourteenth hour. However, as stated previously, the duration of action is a function of the size of the dose and the severity of the diabetes.

There are important clinical applications to be drawn from these studies. First, patients are much better controlled if the total daily carbohydrate is divided in such a manner that the greatest intake coincides with the greatest intensity of insulin action. For this reason, the total carbohydrate is usually divided one-fifth, two-fifths, and two-fifths, for breakfast, lunch, and supper, respectively. Second, the most intense action occurs five to ten hours after injection and hypoglycemic reactions are most likely to occur in the early or middle afternoon, i.e., between 2:00 P. M. and 4:00 P. M. For this reason, a small afternoon snack, such as a glass of milk and one or two crackers or a slice of bread, is necessary in order to prevent the occurrence of any hypoglycemic reaction. Best results are obtained if the total daily carbohydrate does not exceed 150 Grams.

It is now acknowledged by the majority of clinicians that the mild diabetics, i.e., those requiring 40 units or less of insulin daily, are well controlled by a single daily injection of globin zinc insulin. The severe diabetic, however, is still a problem and, whereas many of these cases will respond better to globin than to protamine zinc insulin, they are still poorly controlled and will require supplementary injections of unmodified insulin for best control. Andrews *et al.*,<sup>52</sup> however, feel that globin is

the insulin of choice, particularly in severe diabetics.

**Advantages:** (1) Globin insulin is particularly valuable in regulating patients who have a rise in blood sugar after eating only, and not during the night after fasting. (2) Because of its peculiarities of action, hypoglycemic reactions, when they occur, are at a time when they can be promptly treated. A sense of weakness and chilliness was the outstanding symptom of hypoglycemia in many patients, the latter often persisting for an hour or more after all other symptoms had disappeared. (3) Fewer allergic reactions occur with globin insulin which causes it to become particularly valuable to those diabetics who are allergic to protamine zinc insulin. (4) It is a clear solution. (5) It is valuable as a supplement to protamine zinc insulin in the control of those patients whose fasting blood sugar is normalized by the latter but who require an additional daytime adjuvant to prevent postprandial hyperglycemia and glycosuria.<sup>57</sup> (6) It controls practically all mild diabetics with one daily injection.

**Disadvantages:** (1) Its supposed advantage of homogeneity in solution appears undesirable since the acid solution is precipitated by the alkaline tissue fluid on injection with resulting inconstancy of action from dose to dose, depending on completeness of precipitation in individual depots (Colwell). (2) As stated by Peck, "Acid, or clear, insulin modifications seem more likely to dump out their insulin at odd moments and result in unexpected hypoglycemic reactions." (3) Daily morning injections fail to permit the overlapping effect so essential for good control. (4) Its hourly carbohydrate-handling ability is too low to cover the diet in most severe diabetics. (5) Many patients complain of marked burning on injection. (6) Dietary juggling with its various disadvantages, is essential for best results.

It should be noted that in more rapid and intense action than that obtained with protamine zinc insulin, duration of effect has been sacrificed. In addition, action is not intense enough to control exogenous

carbohydrate metabolism in the severe diabetic and is sufficient in the mild diabetic only through certain dietary adjustments.

#### 5. INSULIN MIXTURES AND MODIFICATIONS

Much work on mixture of soluble and protamine zinc insulins and various modifications of protamine zinc insulin has been carried out by MacBryde and Roberts<sup>63, 64</sup>, Colwell<sup>4, 65-67</sup>, Peck<sup>23, 68-73</sup>; Ulrich<sup>74</sup>, and others<sup>75-81</sup>. Lawrence<sup>40, 41</sup> was probably the first to suggest the mixing of regular insulin and protamine zinc insulin in the same syringe. As early as 1937, Lawrence wrote: "A combination of the two types of insulin action is needed to turn the severe diabetic into a physiological organism and this has not yet been achieved by any single preparation. The next best thing, however, is to mix soluble and suspension insulin in correct proportions and give them in one injection. So far, a mixture of these two insulins in one bottle has not been produced, but we have satisfied ourselves by clinical experiments that soluble and suspension insulin can be given in the same syringe and injected into the same place and each retains its characteristic action." The "correct proportions" consist of that amount of protamine zinc insulin which is necessary to control endogenous carbohydrate metabolism to which is added that amount of soluble insulin sufficient to control postprandial hyperglycemia. Those cases cited had either a slight excess of protamine zinc insulin or equal parts of protamine zinc and soluble insulin.

Ullrich,<sup>74</sup> in 1941, in a series of experiments, showed that with mixtures of equal parts of protamine zinc insulin and regular insulin there was an effect definitely different from that which would be obtained from corresponding doses of protamine zinc insulin and regular insulin injected separately. For example, since there is approximately 40 per cent excess protamine in protamine zinc insulin, mixing 1 cc. u-20 regular insulin and 1 cc. u-20 protamine zinc insulin would produce a resultant mixture containing 28 units of protamine zinc insulin and 12 units of regular (uncombined) insulin provided protamine com-

bines quantitatively with added free insulin. The action obtained from this mixture is less immediate than that obtained with separate injections of protamine zinc insulin, 28 units, and regular insulin, 12 units, but was definitely greater than with protamine zinc insulin alone.

The combination of protamine zinc insulin and regular insulin in mixture can hardly result in 1:1 combination since Colwell<sup>66</sup> and his associates showed that even when insulin is added in excess over protamine zinc insulin up to 4:1 proportions, little of it remains in the soluble form in the supernatant liquid. In other words, even when as much as 64 units of soluble insulin is mixed with 16 units of commercial protamine zinc insulin, only about 3 units, or one-twentieth of the added insulin, stays in solution. Thus the accelerated and more intense action of such mixtures cannot be due to ordinary insulin in solution.

The explanation of this action, which is probably most correct, conceives of an entire series of protamine zinc *insulins*, of which the commercial product is only one, in which increasing amounts of insulin may be combined in an increasingly "insulin-saturated" insoluble complex up to the saturation point. This series of precipitates has the following properties: (1) more prompt and intense and less prolonged activity than commercial protamine zinc insulin; (2) monophasic action suggesting insulin in a single complex rather than in two compounds; (3) little insulin in solution even when added in 4:1 excess or in 2:1 excess when buffered to a pH of 7.2; and (4) excess insulin is combined firmly in a protamine zinc insulin complex because it does not dissolve on buffering to a pH of 7.2 unless buffered immediately after solution. This would nullify Ullrich's explanation<sup>74</sup> that added insulin may not be combined firmly with protamine accounting for difference in action.

The preparation obtained by mixing protamine zinc insulin with regular insulin has a pH between the two. Both Colwell<sup>4, 65-67</sup> and Peck<sup>23, 68-73</sup> believe that these mixtures are stable for many months and that their



action does not vary appreciably when they are freshly mixed in the syringe on injection. Palmer<sup>81</sup> believes that it is better to prepare a mixture in one vial than to prepare it daily in one syringe whereas Colwell, Peck, and the great majority of other workers in this field prefer to mix the insulins in one syringe daily.

MacBryde and Roberts<sup>63, 64</sup> approached the problem somewhat differently working with a specially prepared insulin containing 0.5-0.625 mgm. of protamine and 0.1 mgm. of zinc per 100 units of insulin and buffered to a pH of 7.2. This turbid suspension contained approximately 25 per cent rapidly acting (soluble) insulin and 75 per cent slowly acting (precipitated) insulin and is commonly referred to as "NP50". Recently, the stability of the soluble insulin in this preparation has been questioned which, if true, might make the results with this insulin variable depending on its age since fresh lots of insulin would contain a larger amount of soluble insulin than the older ones. MacBryde is continuing his effort to improve this insulin.

*Time Activity:* In effect, a mixture containing equal portions of the two insulins is barely distinguishable from protamine zinc insulin; a mixture containing four parts of soluble insulin and one part of protamine zinc insulin resembles ordinary insulin. Mixtures of 2:1 and 3:1 show intermediate effects—there is demonstrable activity within four hours, peak effects in eight to sixteen hours, and definite waning of effects after twenty-four hours. The intensity of action at its peak is intermediate between regular and protamine zinc insulin.<sup>65, 68, 76</sup>

The percentage of action expended in the first twenty-four hours for the various insulins according to Peck<sup>71</sup>, is as follows: (1) protamine zinc insulin 34 per cent; (2) 2:1 (Regular PZI) mixture 58 per cent; (3) 3:1 mixture 60 per cent; (4) 4:1 mixture 64 per cent; (5) globin insulin with zinc 74 per cent; and (6) crystalline or regular insulin 80 per cent.

*Use:* Those mixtures most commonly used are 2:1 and 3:1. Peck and Schecter<sup>71</sup> in

1944 reported 150 cases using extemporaneous mixtures with the following results: 6 per cent were satisfactorily managed with a 1:1 combination, 16 per cent with a 3:2 mixture, 70 per cent with a 2:1 mixture, and 8 per cent with a 3:1 mixture. Subsequent experience<sup>72</sup> has shown a further decrease in the number of cases requiring less than a 2:1 mixture so that the proportion of cases now taking 2:1 combinations has enlarged still further.

Colwell's<sup>67</sup> most recent experience in a group of 150 severe diabetics revealed 85 per cent improvement on 2:1 and 3:1 mixtures. Hildebrand and Rynearson,<sup>77</sup> Palmer<sup>81</sup>, and Sparks and John<sup>76</sup> found that the 2:1 mixture was most commonly and effectively used, whereas Ullrich<sup>74</sup> prefers a 3:2 mixture. Of interest is a series of 80 cases reported by Aldersberg and Dolger<sup>80</sup> in which 35 per cent of their cases were well regulated on "surplus protamine" mixtures (ratios 3:4, 2:3, 1:3, etc.) whereas only 21 per cent were regulated on "surplus regular" mixtures (ratios 2:1, 3:1, 3:2, etc.)

MacBryde and Roberts employing "NP50" reported 90 per cent success in 110 cases and del Fierro and Sevringhaus<sup>79</sup> reported excellent results in 14 of 16 cases. As stated by Peck,<sup>72</sup> the degree of clinical improvement with a 2:1 mixture, as advocated by Colwell, and the specially modified protamine zinc insulin, as advocated by MacBryde and Roberts, was for practical purposes equal. The general character of the curve obtained with the 2:1 mixture was smoother and subjected to less periodic variation but both curves were well within normal limits. As stated previously, however, NP50 has not been developed to such an extent as to meet rigid market requirements.

The method of regulation as described by Peck is as follows: Replace multiple injections with single dose admixture: (a) Replace total with 2:1 mixture; (b) If daytime glycosuria and hyperglycemia (2 hours pc) persists, increase insulin content, e. g. 2½:1, 3:1, etc.; (c) If fasting glycosuria and hyperglycemia persists, increase amount of PZI in mixture, e. g., 3:2.

The technic of mixing the two insulins is easy to do but difficult to explain. Patients must actually be shown how to make their mixtures. The new feature to be learned is how to draw an air bubble into the syringe and roll it through to mix the doses.<sup>73</sup> It must be emphasized that the dose of unmodified insulin is drawn into the syringe first. Since all the daily doses are combined in one injection, a preparation containing 80 units per cc. is preferable in order to lessen the volume of fluid injected. Preparations of the same manufacturer should be used in order to keep conditions as constant as possible.

It has been our experience that at least half of the patients requiring a mixture are eventually well regulated on fewer total units of insulin daily than previously. For this reason, we feel that it is probably desirable for the 2:1 mixture to contain approximately three-fourths as many total units to prevent undesirable hypoglycemic reactions. As suggested by Colwell, it has been possible, in a large series of severe diabetics to shift directly from protamine zinc insulin to a 2:1 mixture, when needed, without a single indication for a preparation intermediate between the two.

Colwell has stated that best results are also obtained with a diet containing carbohydrate and fat in the ratio of 3:2 in Grams, and response is better if the total daily carbohydrate is in the vicinity of 150 Grams. It is also possible with these modified insulins to eat three equi-caloric feedings daily although we have not insisted that patients previously using protamine zinc insulin and accustomed to a bedtime snack give up this meal.

As regards the choice between adjustable mixtures and the use of a premixed preparation such as NP50, the former seems quite preferable since the action of the preparation can be "tailor made" to fit each person's needs.<sup>73, 76</sup>

**Advantages:** (1) The action of these mixtures is rapid and intense enough to control postprandial hyperglycemia and glycosuria without producing hypoglycemia between meals; (2) Action is long enough

to control nocturnal blood sugar but not intense enough to produce distressing hypoglycemic reactions during this time; (3) Action persists beyond twenty-four hours which permits the overlapping effect so essential for good control. (4) Hypoglycemic reactions are infrequent but, because of the peculiarities of the mixture, if they do occur, they are most common within the first 12 hours when they are easier to recognize and treat. (5) The use of these preparations obviates tedious dietary readjustments. (6) Only one daily injection of insulin is required; (7) It does not increase the number of insulins commercially available which would, in turn, further complicate the treatment of this disorder.

**Disadvantages:** A minor disadvantage is the difficulty which the patient may encounter when attempting to mix the two insulins in a single syringe prior to injection. We have, however, been able to instruct patients of low intelligence adequately in the Out-Patient Department with excellent results.

It would thus seem that these mixtures of regular and protamine zinc insulin, which are "tailor made" to fit the individual, exhibit those properties essential for the ideal insulin to possess. The indications for extemporaneous mixtures are those cases which are not adequately regulated by one daily injection of globin or protamine zinc insulins and who require multiple injections of regular insulin for adequate control.

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# DEFINITION, ORIGIN AND GENEALOGY

To avoid confusion with other surgical groups in America which claim to be of European parentage, a brief reference to the foundation and genealogy of this truly historical society is in order.

The International Society of Surgery was born in Brussels on September 9, 1902, under the auspices of the Belgian Society of Surgery with the collaboration of the leading surgeons of Europe and later of Britain, including Holland, France, Germany, Austria, Italy, and Spain, who had been invited to meet in Brussels to consider the creation of an international society of world-wide scope with its chief aim and purpose to organize world congresses, where the leading surgeons of the different countries could come together fraternally, in a common effort to contribute to the advancement of surgery, by the discussion and elucidation of their various surgical problems and scientific interests.

The Fellows of the Society were to meet in a spirit of scientific neutrality, free from nationalistic, partisan, racial, or religious prejudices. All the surgeons of Europe and America had realized by this time, at the bend of the century, that the time had come when surgery, profiting by the discoveries of Pasteur and of Lister, was making progress with gigantic strides, and that it was necessary to meet in international parliaments where the vast accumulations of new knowledge could be presented, appraised and stabilized for their definite value. The apparently assured political neutrality of Belgium, "guaranteed" by the great western European powers, in the famous treaty of London in 1839, (later proved to be a mere "scrap of paper," by the Germans when they invaded Belgium in 1914), seemed to make this a favorable country for a trial of difficult international organization. Fortunately the delegates of the different countries assembled in Brussels, agreed with their Belgian colleagues that the time had come for a trial of this enterprise and promptly approved the constitution and by-laws of the new society, with orders that the first international congress of surgery should be held in Brus-



## THE INTERNATIONAL SOCIETY OF SURGERY (SOCIETE INTERNATIONALE DE CHIRURGIE) FOUNDED IN BRUSSELS, BELGIUM IN 1902.\*

The announcement by the local committee of arrangements of the International Society of Surgery that this distinguished world-embracing association will hold its 13th international congress in New Orleans on October 9-15, marks an event of unusual interest and importance to the medical profession and people of this city.

\*An introduction to the International Society of Surgery in happy commemoration of the 13th Congress to be held in New Orleans for the first time October 9, 1949.



sels, in the fall (September 18-22) of 1905. Coincidentally with the adoption of the constitution, an international committee consisting of the delegates of the nations entering into the convention, was appointed with an executive committee at its head, consisting of The Belgian Quartet, Charles Willems of Ghent, Chairman, Antoine Depave, Secretary-General and Jules Lorthioir, Treasurer.

The Willems-Depave-Lorthioir Committee worked assiduously and with great earnestness, at their task; and so well, that by September 18, 1905, 26 different nations and 700 members were qualified and registered as members of the Society.

#### THE FIRST AMERICAN CONTINGENT

The United States was represented by 57 Fellows headed by a national committee consisting of Roswell Park (Buffalo, N. Y.), Chairman; J. Collins Warren (Boston); and Lewis McArthur (Chicago). The distinguished character and professional eminence of the American contingent was shown in the portrait gallery of the membership, published by Secretary Leopold Mayer, in the *Transaction* of 1926, where the American members were all, without exception, leaders and teachers of national reputation, each identified by some notable achievement in the domain of surgery.

This excellence of the American members, shared with those of other nations, was easily explained by the fact that admission to the Society could only be obtained by the approval of the national committee of each nation who passed on the merits of the candidates by their ethical and surgical reputation and achievements in their own countries. Besides the approval of the national committee the applicant would not be given full voting membership until he had been endorsed by the international committee at each congress.

The fact that the Society had been cast in an academic mold at its very birth, was shown by the limitation of its membership to a definite quota for each nation. The quota was revised at each congress and adjusted in proportion to its membership. The limitations of the quota and the strict observance of the standard of qualifications

for admission, no doubt kept many worthy candidates from admission and led them to find relief for their ambitions by joining other societies in which no high fences were an impediment to easy entrance. The International Society has never aimed at *quantity* in its membership or at profit outside of its purely scientific and professional needs. It has always welcomed professional surgeons, who were capable of advancing the purposes of the Society by their learning and their capacity to contribute to the high scientific and professional merit of the organization.

#### THE ROYAL GREETINGS

The Society, from its very inception, was honored, encouraged and supported by the rulers and governments of the countries in which the congresses were held. The inaugural sessions in every one of these congresses have always been opened by the ruling head of the country whether a King, an Emperor, or a President. The eloquent speeches and the presence of the Ministers of State, Health, Education and Defense, in full uniforms, gave great brilliancy and impressiveness to these occasions.

#### THE ANCESTRY OF THE INTERNATIONAL SOCIETY

It is interesting to note that the fusion of the Belgian Surgical Society with the National Committee of the 26 nations that participated in the assembly of 1902, resulted in the formation of a new society which incorporated in its history all the ancestral surgical achievements and heroes of each one of the participating nations. In this way the International Society of Surgery may claim in the historical ancestries of its component nations, the names of the greatest masters of surgery in the world, as part of its own collective inheritance. Such are the lives of great and glorious searchers and discoverers as Andreas Valsalius (1514-1564), born in Brussels, father of human anatomy and the founder of rational surgery, based on an accurate knowledge of the human frame; Harvey, Hunter, and Lister in Britain, noblest of the immortal seers; Pare, Chaulliac and Pasteur in France; Langenbeck, Graffe, Esmarch in Germany; Billroth in Austria; Boerhave and van Swieten in Holland;

Tagliacozzi, the father of plastic surgery, in Italy; Gimbernát in Spain; and last but not least, is the gift from America, the youngest in the line of its benefactions,—Morton and Long who discovered surgical anesthesia and, McDowell, the intrepid abdominal pioneer.

The genealogy of surgery proves that all the discoveries that constitute its greatness are largely borrowed from different countries and races.

#### PRESIDENTS

The presidents are elected by the International Committee of delegates from the different constituent nations. All the presidents have been historically identified by some important general or special contribution to the advancement of surgery.

The Society had twelve congresses with the thirteenth under way and rapidly approaching. The first congress was held in Brussels (1905) under the illustrious presidency of Professor Theodore Kocher (1841-1917), of Berne—justly regarded as one of the safest and most skilful surgeons in the world. His clinic at Berne became the surgical mecca to which patients flocked from all parts of the globe, but particularly for the surgical cure of goiter. He performed over a thousand thyroidectomies with the lowest known mortality. His text book on operative surgery, translated into all languages was the current guide of most surgeons of his day. He was awarded the Nobel prize in 1909, for his researches in goiter. Dr. Halsted of Johns Hopkins was his close friend and admirer and spent many of his vacations at his clinic. Harvey Cushing worked in his laboratory and clinic in preparation for his future career as the leading neurosurgeon of his time.

Vincent Czerny (1842-1916) eminent surgeon, specially devoted to the study of cancer, at the head of his world renowned clinic at Heidelberg. Lucas Champoniere (1843-1913) studied antiseptic surgery under the Master, Lister, in London, and introduced it in France. He was a pioneer in the treatment of fractures by early mobilization and massage to prevent muscular rigidity and atrophy; a pioneer in the sur-

gical treatment of hernia and in many other surgical innovations. Antoine Depage (1862-1925), a powerful, tall man as well as intellectual giant, of great enterprise and originality in the building of hospitals and in devising new operative procedures especially applicable to military surgery and the author of the most complete bibliographic indices. President of the International Society in New York, 1914, he was hurried back to Belgium to direct the medical department of the Belgian Army, of which he was Surgeon General, which had been caught unprepared for an invasion without declaration of war. During the first World War he stood by the side of the heroic King Albert, of the Belgians, in holding a strip of shore on the edge of the North Sea, at LaPanne, where he built a hospital and refuge for the Belgian and allied wounded. There, Queen Elizabeth, the Royal Consort, aided by Mme. Depage, directed the nursing staff with a corps of patriotic Belgian scientists who improvised clinical laboratories for scientific work. Mme. Depage collaborated with the ill-fated Edith Cavell, the martyred English nurse, in establishing a home and training school for nurses. Mme. Depage appealed to American philanthropists for the relief of the allied wounded at La Panne. Meeting with a very generous response from America, she was returning home but met with a tragic end in the sinking of the *Lusitania*, by a German torpedo, off the coast of Ireland. Her body was identified and brought back to Belgium. Her husband, Dr. Depage, surgeon general of the Belgian Army, a broken-hearted man, soon followed; he died on June 10, 1925, and was buried beside her in the same grave. Both of these heroic figures are now in the same tomb, sharing the glory of their common patriotism.

After an interval of six years from 1914 to 1920, the first attempt to restore the activities of the International Society was made in Paris under the presidency of Professor W. W. Keen (1837-1932), Philadelphia,—first American president—pioneer in brain surgery and most prolific writer of classic surgical essays and editor of sur-



gical systems and text books. This meeting proved very encouraging and enthusiastic despite the deep resentment felt by the Fellows in the still lingering echoes of the furious anathema of the defeated German "intellectuals."

Eighteen years of prosperity followed, during which six international triennial congresses were held in succession; in London (1923) under Sir William MacEwen (1834-1924), the eminent surgeon of Glasgow and profound investigator of the endocranial infections; British science, the Crown and the Government were admirably represented. In Rome (1926), the 7th Congress was held under Professor Giordano (1864- ), the universally known surgeon in chief of the City Hospital of Venice. This was a remarkable congress. It was notable not only by the beauty and dignity of its architectural surroundings and the excellence of the scientific program and very large and distinguished audience, but by (1), a marvellous tour of the Italian universities; (2), by a sonorous address, delivered in Latin, by the President—a great scholar as well as a master surgeon; (3), a most eloquent eulogy of the *surgeons*, by Sig. Benito Mussolini, the Premier and head of the Italian government, in which Il Duce confirmed his traditional oratorical fame; (4), an attempt to assassinate the Premier on leaving the Hall of the Congress. The attempt was thwarted by the quick action of Dr. Giordano, President of the Congress, who struck the arm of the would-be murderess (an insane woman), in time to deviate the course of the bullet from the temple to the nose, causing a grazing wound which did not prevent Mussolini from attending his official business the same day.

The following 8th Congress was held in Warsaw (1929) under Professor H. Hartmann (1860- ), of Paris; the 9th Congress in Madrid under Professor F. de Quarvain (1868-1940); the 10th Congress in Cairo (1935) under Dr. J. Shoemaker (1871-1940), of the Hague, who was called to the Presidency in replacement of Professor von

Eiselberg, of Vienna, who was too ill to travel.

#### COMMENTARIES ON THE CONGRESSES

All these congresses were magnificent triumphs of the Administrative Bureau at Brussels, with Dr. Mayer, its guiding spirit, at its head. It is impossible to do justice to the wonderful collaboration and cordiality of our Colleagues in London, Rome, Warsaw, Madrid and Cairo, where the scientific programs were carried out, at times, under the strain from local political disturbances, as at Cairo; but always carried out most learnedly, conscientiously and profitably for all concerned. In all these congresses, the tourist excursions and sea cruises continued to be most valuable contributors to the pleasure and the educational profit of the congressists.

At Cairo, the International Committee realized that the time had come for the election of an American president. After several nominations, Dr. Rudolph Matas (1860- ), Emeritus Professor of Surgery in the Tulane University of Louisiana, universally known for his original contributions to vascular surgery\* was chosen and notified by cable, of his election *in absentia*. On receipt of his acceptance, his election was unanimously confirmed for the triennium, culminating with his presidency of the 11th Congress, of Vienna in 1938.

Unfortunately, the well organized plans for the congress in Vienna, were frustrated by the command of the Führer, Hitler, who forbade the Congress in German territory because the International Society admitted Jews to its membership. In consequence, and despite the protests and apologies of the Vienna surgeons and of the regrets of the German Surgical Society, the Vienna Congress was transferred to Brussels, its birthplace, where the Congress was received with a warm welcome by the profession and the government.

#### THE AMERICAN BRANCH OF THE INTERNATIONAL SOCIETY OF SURGERY

The dark clouds which had begun to gather over the 11th Congress at Brussels, con-

\*Up to 1940, 640 operations on the main surgical arteries of which 260 were for aneurysms, with a gross operative mortality of 4.83 per cent. *Annals of Surgery*, vol. 112, Nov., 1940, pp. 802-859.

tinued to grow darker with the increasing Nazi persecution of the Jews, until the invasion of Poland in 1939 and the occupation of Belgium a few months later precipitated the explosion which shook the whole of Europe, including the frightful devastation in war-stricken Spain. So completely ruined were the countries involved in this second world war, that all the sources of professional knowledge and industry were completely suspended, including in this all the activities of the International Society. The Bureau at Brussels was excluded completely from all communication with the outside world during the German occupation of Belgium,—until the surrender of the German generals and deaths of Hitler and Mussolini, in 1945, put an end to the strife in Europe.

It was on November 1st, 1941, when the Nazi regime was at the height of its power over Belgium, that the Executive Committee of the American Branch of the International Society,—Drs. Elliott C. Cutler, Rudolph Matas and Eugene Pool, met at the Harvard Club in Boston on November 6, 1941, with other members, to consider plans of relief for the oppressed parent society in the grip of the enemy at Brussels. This was accomplished at a meeting held in the New York Academy of Medicine, November 12, 1942.

At this meeting a Council of Delegates representing all the branches of the Society in the Western Hemisphere, including North America, Mexico, Central and South America, and the West Indies. Dr. J. Arce, of Buenos Aires, Vice-President of the International Society since the Brussels Congress of 1938, was placed at the head of the Council and acted in this capacity until its dissolution at Cleveland on December 19, 1946. The Council appointed the United States National Committee (Cutler, Matas, Pool, Allen) who, acting under the authority of the Council continued to conduct the business of the Society until the automatic dissolution of the Council.

#### THE INTERNATIONAL SOCIETY IN AMERICA

As a result of the American administration with the authority of the Council of Delegates, the official continuity of the In-

ternational Society was preserved until the liberation of Belgium permitted the Bureau at Brussels to resume its normal functions.

#### THE CORRELATION OF THE INTERAMERICAN CONGRESSES CONJOINTLY WITH THE CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

Unfortunately the greatest aim of the American Committee and of the council of delegates, which was to hold a polyglot, multilingual, surgical congress annually during the period of the war, conjointly with the yearly clinical congress of the American College of Surgeons, was completely nullified by the order of the War Department which advised against all meetings and great aggregations of people in large cities in line of communications. In this way the best opportunity to preserve the interest and loyalty of our members particularly those in the Latin American countries of the Western Hemisphere, was lost. On the other hand our North American Fellows who were members of the American Surgical and Southern Surgical Associations met regularly with these societies in their spring and winter sessions to discuss the reports of the Secretary-Treasurer, Dr. Matas, of the International Society of Surgery while keeping in touch with the scientific programs of the Society. While the United States National Committee met with the aforesaid societies, the most important work of correspondence and information was carried on in New Orleans at the office of Dr. Matas, Secretary-Treasurer.

Shortly after the organization of the American Committee for the relief of the Administrative Bureau at Brussels, the Committee was deprived of the very valuable collaboration of Dr. Cutler, who was transferred to London, as chief consulting surgeon of the armed forces of the United States at the Western Front; fortunately, he continued to serve as Chairman *in absentia*. Dr. Arthur W. Allen, also of Harvard, accepted the office and replaced Dr. Cutler up to the time of Cutler's greatly deplored death.

#### THE CHOICE OF NEW ORLEANS FOR THE THIRTEENTH CONGRESS

It is no doubt largely due to the remem-



branch of the long and arduous labors of the secretary-treasurer residing in New Orleans that members here and in Europe meeting in London decided to select New Orleans as the site of the next (13th) Congress. Though it is not unlikely that the International Committee in London, was influenced in the selection of New Orleans for the next Congress by sentimental reasons of gratitude for the secretary's faithful services during the whole period of the war, without expense to the Society, it would seem quite clear that the selection of New Orleans, the most cosmopolitan city in the United States, with its French and Spanish historic and romantic traditions had a strong appeal of its own, for its selection; besides, its constantly growing intercourse with the Latin American populations since the advent of aerial navigation and radio communications, is the most fit city, from the view point of the International Society's interest to receive and entertain the members of the 13th Congress, who were so largely representative of the Latin countries in Central Europe and the Mediterranean shores. Again, New Orleans could show by the side of the most precious relics of its French and Spanish architecture the latest and most approved hospital and other institutions for the sick and injured where the modern generations of surgeons, availing themselves of the latest equipments, are busy perpetuating and spreading the renown of their surgical ancestors.

NEW ORLEANS A MEDICAL CITY MADE PROSPEROUS  
AND HAPPY BY MEDICAL SCIENCE

By an unexpected and agreeable coincidence, the year 1905, which marks the date of the first International Congress in Brussels, the same year remains immortalized in the history of New Orleans as the year of the great victory of medical science over the yellow fever plague which, for a hundred years had kept New Orleans under its deadly domination. It was that year, when the surgeons of the world assembled in Brussels were celebrating the triumph of the Pasteurian doctrines and of the Listerian revolution, which had freed surgery from the tyranny of the septic microbes that people of New Orleans were celebrat-

ing the first decisive victory of sanitary science against "the yellow ogre of the Tropics," who for over a century had desolated Louisiana and the States bordering on the shores of the Gulf of Mexico, with the epidemic spread of its deadly visitations. Led by the teachings of Finlay of Havana and the heroic sacrifices of the United States Army Yellow Fever Commission (Reed, Carrol, Lazear, and Agramonte) the culprit virus-carrying mosquito, (*stegomyia fasciata*) was discovered and the methods and means for its extermination were applied by the illustrious Gorgas in 1900, at Havana. This success brought about the extinction of the *stegomyia fasciata* in New Orleans in 1905.

Forty-four years have elapsed since New Orleans, the worst plague stricken city of the continent, has been transformed into the healthy, prosperous, and ever-growing metropolis that it is today. Through this marvelous transformation it is possible to welcome the great company of the elect of surgery, who will soon arrive to receive our warm hearted hospitality, without fear of the infection of yellow fever, malaria, and other tropical pests, which would have made impossible the cordiality of our reception. Fortunately, "yellow jack" remains only the tragic memory of a long dead past.

The Congress held in London two years ago showed the wonderful recuperative power of the International Society in the face of adversity and in that exhibition of its robust vitality, it found its most stimulating encouragement in the example of indomitable courage, fortitude and equanimity of spirit amid the calamities of war, displayed by their hosts,—the British people and their surgeons,—that command the world's greatest respect and admiration.

SOME OF THE ACTIVITIES OF THE INTERNATIONAL  
SOCIETY

The Society publishes an official journal in which every article is summarized, at the end, in five languages of the congress.

The transactions of each congress appear usually in three bound octavo volumes, averaging from 850 to 900 pages each, with illustrations.

All the addresses, articles and discussions

are translated textually or in full abstract, in the official language of the congress. Besides the Transactions, a biographic and bibliographic Index Catalogue with more than 1,200 portraits of the Fellows of the Society was first published in 1933-1934, under the editorship of the Secretary General (L. Mayer), in two large octavo volumes. These were distributed in 1935 to all the members without extra charge. The Index-Catalogue is not only a valuable directory of "Who's Who" in the International Society as this is represented in the Fellowship of the Society, but it is also highly valuable as a classified bibliographic index to the 250,000 surgical pages that the Fellows of the Society have contributed

to the professional literature up to 1935.\* These contributions cover every phase of the vast technical and literary activity that has characterized the marvelous advance of surgery during the more than four decades that the International Society has been in existence, and no better commentary need be quoted on the scientific work of the Society than the fact that every outstanding and epochal advance in surgery has been contributed during this period by its members.

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\*The publication of the Illustrated Biographic Index Catalogue of the Society and its members was interrupted by the second World War but preparations for the continuance of this invaluable publication have been resumed.



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## WHAT HAPPENED IN WASHINGTON

Important decisions were made in Congress in the past month. Two actions were taken in the interest of organized medicine and of the public, and these actions were taken in opposition to the desires of the most powerful political machine since the Civil War.

The first of these decisions was taken by the Ways and Means Committee to exclude physicians, dentists, and lawyers from the operation of a proposed expanded Social Security law. This action was taken after energetic presentations from various quarters were made to the Committee, and were largely assisted by our representative, Mr. Hale Boggs. A proposed law would levy a

2¼ per cent tax on all self employed individuals on the first \$4800 dollars of net income, or approximately \$100 a year. However, the insured after the age of 65 could receive no part of this "insurance money," if he had any other income amounting to \$14.99 a month, or more. In other words, 140,000 doctors would contribute \$14,000,000 a year, of which the vast majority would receive no benefit whatsoever. The relief from such an unjust burden of selective taxation is a thing for which we thank the various spokesmen for organized medicine, the officers of the State Society, particularly Dr. Zander, and the Committee on Congressional matters, and Representative Boggs.

The second decision was even more important. It was the rejection by the Senate, with a vote of 60 to 32 of President Truman's reorganization plan No. 1. Had the Senate not disapproved the plan it would have had the effect of submerging the governmental aspects of medicine to welfare projects of a cabinet post and elevating to that post Oscar Ewing, who is a vociferous advocate of compulsory sickness insurance—the apostle of State Medicine. The effects of this victory will be far reaching. In pleading for his cause before the Senate committee, Oscar Ewing stated that if the plan were rejected only noncontroversial plans can be put through. In other words, he recognized the issue as a test of strength, not only of the plan but of the whole project of building a political empire of welfare, medicine, insurance and security. The defeat of such a scheme is therefore equivalent to defeating compulsory sickness insurance and State Medicine for this Congress, and it may be expected as an issue in the Congressional election of 1950.

The medical profession should take cheer from this accomplishment, and each of us would do well to reflect upon how it was done and what it means. Up to the hour of voting in the Senate, the result was in doubt. In the weeks preceding August 16, various agencies within the realms of organized medicine had presented their reasons,

for opposing the President's plan, to members of the Senate and House. The officers of the State Society have been active in contacts with members of Congress. A meeting was held in Little Rock and another in Denver where plans were made for effective effort. Our committee on Congressional matters was represented in Washington by Drs. E. L. Zander and C. J. Brown. It has been stated that the physicians of the country, and the public, owe an unrealized debt to the citizen delegations from Arkansas, Oregon, California, Minnesota, Louisiana, Texas, Oklahoma, Kansas, and Virginia.

That the opponents of the plan took the issue seriously is shown by the words of Senator Humphrey (Democrat-Minnesota) who said that the A. M. A. was responsible for an adverse vote in the Committee and charged that if the plan "is killed because of the opposition of one lobby on behalf of a small group that is not even affected by it except in imagination, then we shall have offered proof that a democratic government cannot order its own affairs effectively. This is the test."

The conclusive majority by which the plan was killed was the result of education of the public on the topic of State Medicine and producing in the minds of the Senators the realization that the public knows what it wants. This is the culmination of years of activity and of ten months of intense effort. The way has been guided by the A. M. A. and state societies, but the work of local societies gave precision and point to the feelings of the doctors and the public.

With this in mind, never again should

organized medicine take an attitude of disinterest where its affairs touch the public. We must ponder the vagaries of the leukocytes at the same time as we consider the endless contacts of our public relations. We should be aggressive in stating our position and in securing the adaptation of the problems of medicine to the needs of the public.

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### MEETING OF INTERNATIONAL SOCIETY OF SURGERY

New Orleans will be the focal point for a world-wide gathering of renowned surgeons, October 10-15, 1949, when the International Society of Surgery will meet here.

This is one of the oldest surgical societies in the world, having been founded in 1902, and numbers among its members some of the foremost surgeons of the world, whose achievements are known not only to the medical profession, but whose names are known and revered by the lay public. One of these leaders who is thus famous is New Orleans' Dr. Rudolph Matas, who has been both secretary and president of the International Society of Surgery.

An excellent account of the history and accomplishments of this society, prepared in collaboration with Dr. Matas, will be found elsewhere in the Journal.

The Louisiana State Medical Society and its component organizations bids a welcome to the International Society of Surgery and hopes that the sojourn of its members in New Orleans will be not only instructive and profitable, but happy and enjoyable.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### REPORT OF CONFERENCE OF OFFICERS OF COMPONENT SOCIETIES

As representative of the Louisiana State Medical Society to the Fifth National Conference of Presidents and Officers of

County Medical Societies on June 5 at Atlantic City, I wish to report a few highlights of the meeting.

At 9:00 a. m., a panel discussion concerning plans for handling emergency calls on



a 24 hour basis through different types of telephone answering services was held. This was followed by discussion of plans of various county and state societies for the care of indigent patients. Another panel discussion concerning responsibility of parish societies for community health programs and participation in the national education campaign was held. I cannot begin in a small space to give you the salient points of these discussions. However, I shall refer you to two booklets published by the Council on Medical Service of the AMA entitled, "Planning for Emergency Medical Calls", and "The Community Health Council". It would be worthwhile for every doctor sincerely interested in the welfare of his patients to study carefully and thoughtfully these two pamphlets. It is just as important today for all of us to be well versed in the socio-economic and political factors which affect our patients as with the strictly scientific phases of medical practice; for whether we appreciate it or not, he will be more influenced by our public relations technic than our scientific technic.

At the afternoon meeting the delegates were presented with a review of the first year of the British National Health Service in which was brought out the fantastic cost and inherent defects of the system.

Dr. George Lull explained the intimate relationship of the state medical societies to the AMA. In another paper, the importance of bringing allied organizations of dentists, nurses, receptionists, druggists and drug salesmen into closer association with our societies was stressed. Only in that way can the art of medicine, (harmonious relations) be developed to its maximum among our members.

Probably the most stirring presentation of the afternoon was a talk by the famous author Cecil Palmer of London, England, on the impact of socialized medicine on the British physician and his patient. Throughout his talk he stressed the fact that compulsory health insurance should be fought on a moral basis, strictly. For socialism in theory is very different from socialism in practice. To quote his words, "In Britain

the doctors were winning all along the line, and it still is a mystery to me as it is a mystery to many of my fellow country-men and is a mystery to many members of the British medical profession—how it came about that at the eleventh hour, the medical profession gave up the ghost. I believe it was due to the fact that the Minister of Health in our present Socialist Government was able to divert the issue from the moral basis to the business. He was able to make the doctors, by a very clever political formula, discuss terms of service, whereas the doctors would have been on a stronger ground if they had said there were no terms of service under which they would degrade medicine by serving a state salaried medical service. I say the medical profession in Britain made a contribution to the servile state that had not been exceeded by any previous measure of nationalization in my Country. When the doctors were out and free, we had a chance; but when the doctors came in and made themselves the servants of the state—then we, indeed, had come to a position in which it would seem, at this moment, that we cannot possibly recover."

I. W. Gajan, Jr., M. D.

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#### OBSERVATIONS CONCERNING AMA MEETING

There is an experience which every doctor practicing medicine in America should have. It is as important a part of our medical education as the study of human anatomy. That experience is a first-hand study of the anatomy of your own House of Delegates at an AMA meeting. The sponsors of collectivism in America are trying to make you and me believe that our organization leaders are nearsighted men, interested only in their own aggrandizement. Spending some time at these business meetings will immediately dispel in our minds any idea of undemocratic procedure. All problems that intimately concern us as doctors and the American public who employ us, are openly discussed and passed upon by the doctors chosen directly by the rank and file. Before committee meetings there

were at the 1949 Session several laymen who presented views on problems facing us today. If your idea or plan of action is good you can be sure you will receive attention.

I do, like most of us, attend medical meetings to learn some new approach in the art and science of medicine. Much is gained and little is lost if each of us would spend a small portion of the time at business meetings of our representatives' bodies in order to better perfect ourselves in the art of medicine, so important today when our individual concepts of good scientific medicine are being so sorely pressed. No one understands, better than a physician, how important is continuous education in the best interest of those we serve (which includes us as human beings). When we learn that operation for a certain cancer is the best method of procedure we advise our

patients and usually secure their permission. We must also learn the best therapeutic measures for the illnesses of the body politic which are intimately connected with psychosomatic medicine. For this knowledge we have no textbook or journal. It is only learned in the give-and-take and free exchange of ideas in our parish, district, state and national societies. If you and I do not inform ourselves and participate, we can blame no one but ourselves for foreign ideologies being thrust upon us. For whether we realize it or not, as a group we are an integral part of the most successful form of living the world has yet devised. Just as we never relax or "let Joe do it" in our constant fight on disease, we must never tire of supporting and encouraging the elementary principles of our form of living.

I. W. Gajan, Jr., M. D.

## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

#### DIABETES WEEK

OCTOBER 10-16, 1949

Dr. A. A. Herold, Chairman, has called a meeting of the Executive Committee of the Diabetes Association of Louisiana, for a date in September, to make arrangements for the Diabetes Week program. This committee consists of the members of the executive committee of the association who will be notified in advance of the right date.

The American Diabetes Association has scheduled an all year round diabetes detection program, which will be initiated with Diabetes Week, October 10-16, in the hope that a concentrated educational effort on the part of all will aid in discovering the one million undiagnosed and untreated diabetic patients in this country.

The American Diabetes Association has requested the cooperation of all state and local medical societies and asked that each medical society

establish a Committee on Diabetes to make preparations for the drive.

The Diabetes Detection Drive was approved by the house of Delegates of the AMA on November 30, 1948 at St. Louis and again on June 7, 1949, at Atlantic City. It will require a concentrated effort on the part of all of us to discover these cases and then to secure treatment for the patients by their personal physicians.

#### SPECIAL NOTICE

There has been considerable misunderstanding as a result of the manner in which the local press reported on the recent vote of the Senate when it defeated Truman's Reorganization Plan #1. The question before the Senate was the approval or disapproval of S.R. 147 which rejected Truman's Reorganization Plan #1. In this vote we should be particularly grateful to Senator Russell Long



for supporting the medical profession by casting his vote in favor of S.R. 147 and, in effect, against the Truman Plan.

## SECOND DISTRICT MEDICAL SOCIETY

The Second District Medical Society met at the Metairie Country Club on August 18 with Dr. Jack Strange, President, presiding. Dr. Wm. H. Gillentine discussed use of digitalis in heart failure, based on a film of the same name supplied by Wyeth, Inc.

The next meeting will be held at the Metairie Club September 15 at which time colored films on common infectious childhood diseases will be presented.

## ORLEANS CHAPTER AMERICAN ACADEMY GENERAL PRACTICE OF LOUISIANA

At the June meeting of the Orleans Chapter of the A. A. G. P., Dr. Peter Graffagnino gave a most interesting and instructive discussion on "The Pitfalls in Obstetrics." His discussion was on:

1. The causes and treatment of rupture of the uterus in all types of pregnancy.
2. Review of bleeding cases and their control.
3. Toxemia of pregnancy.

We are indeed indebted to Dr. Graffagnino for giving us so much practical information in a few minutes and in a manner that was greatly appreciated.

At the July meeting the following officers were elected for the coming year:

President, Dr. Theodore F. Kirn; Vice-President, Dr. Albert B. Pitkin; Secretary, Dr. Vincent P. Blandino; Treasurer, Dr. Eugene Claverie, Jr.

Members of the Board—Dr. Nicholas J. Chetta, Dr. Alvin E. Johnson, Jr., Dr. Robert E. Gillespie, Jr., Dr. George D. Feldner, Dr. Charles V. Mosely, Dr. Cosmo J. Tardo.

The next regular meeting will be held in September and will be a dinner meeting.

## INTERNATIONAL SOCIETY OF SURGERY

The scientific program of the thirteenth Congress of the International Society of Surgery, which will convene in New Orleans October 10-15, will consist of a symposium on the following subjects:

1. Surgery of the Parathyroid, Professor Raffaele Paolucci of Rome, Italy, will lead the discussion.
2. Surgery of the Pancreas. Professor Ian Aird of London, England, Professor of Surgery, University of London; Director of the Surgical Unit of the Post Graduate Medical School of London. (Successor to Professor George Grey Turner), will lead the discussion.
3. Treatment of Post Operative Thrombosis and

Its Sequela. Professor Aiton Ochsner, New Orleans, and Professor Michael DeBakey of Houston, will lead the discussion.

4. Surgery of the Pituitary Gland. Professor Paul Martin of Brussels, Belgium, Professor of Surgery in the University of Brussels will conduct this symposium.

5. Surgery of the Suprarenal Gland. Professor Rene Fontaine of Strasbourg, France, Professor of Surgery at the University of Strasbourg, will conduct this symposium.

6. The Causes of Recurrences after Operations on the Biliary Tract. Professor Rudolph Demel of the University of Vienna will conduct this symposium.

The last two days of the Congress will be devoted to American surgeons; this program will be prepared by Professor Evarts Graham, American Vice-President of the 13th Congress.

This program will consist of reports on Surgical development and research problems, along physiological and biochemical lines.

The list of those attending the Congress will include the most distinguished American, European, South American, and North African representatives. Among the distinguished guests will be Lord Alfred Webb-Johnson, President of the Royal College of Surgeons of England, Professor Rene Leriche, Clarence Craaford of Sweden and many others.

The Congress promises to be one of the high lights in New Orleans—already a city of distinguished gatherings.

The International Society of Surgery is forever linked with such great men as Theodore Kocher, Czerny, Lucas Championniere, Anton DePage, W. W. Keen, William Macewen, D. Giordano, Henri Hartment, Fr. DeQuervain, Shoemaker, Leopold Mayer, and our own distinguished Rudolph Matas, who presided at the Congress in Brussels, 1938.

The medical profession is invited to attend the scientific sessions of the Congress.

## BIRTH REGISTRATION

In April 1945, the Louisiana State Registrar in cooperation with the Federal vital statistics agency, undertook an experiment in ten Louisiana parishes to determine if parent participation in the filing of birth certificates was desirable. The purpose of the plan was to place responsibility for filing birth certificates on mothers instead of the physicians. The test involved the use of a separate birth notification card to be completed and mailed to the local registrar by the physician or midwife performing the delivery.

The National Office of vital statistics very recently sent a representative on a visit to each of the ten parishes participating in the plan for the purpose of discussing the matter with the parish

health unit directors in order that it may properly evaluate the project.

The evidence at hand clearly indicates that the experiment did not produce results which would justify the introduction of this system on a state-wide basis. In many instances physicians expressed resentment at the extra record work in-

involved, and suggested that such a system was a reflection on their professional integrity.

Since no justification can be found for the additional work and expense that the continuation and furtherance of this project would involve, all Parish Health Unit Directors concerned were notified that the "Parent Participation Plan" of birth registration be discontinued immediately.

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## BOOK REVIEWS

*British Surgical Practice*: Edited by Sir Ernest Rock Carling, F. R. C. S., F. R. C. P., and J. Paterson Ross, M. S., F. R. C. S. (In 8 volumes.) Vol. 4. St. Louis, The C. V. Mosby Company, 1948. Pp. 486, illus. plates. Price per set, \$125.00.

This book, which is volume 4 of a series of eight volumes on British surgical practice, is difficult to evaluate. In the first place, although the series constitutes, in effect, a system, the volumes are not loose-leaf and a system, whether or not it is called by that name, in which no provision is made for adding new material is likely to be out of date very soon. In the second place, the present volume, which covers alphabetical subjects from facial palsy to hiccup, includes a number of conditions of questionable surgical interest, such as filariasis and gout.

The most serious criticism to be advanced against this work, however, is the distribution of its available space. Fibrositis, for instance, occupies 10 pages, which is two pages more than the space allotted to gastrostomy and to hemorrhage and one page more than the space devoted to the general management of gunshot wounds. The latter presentation is exclusively military, but it is hard to see how it could be useful to any surgeon, whether he were in or out of the army.

Numerous similar examples could be cited, but the space allotted to hernia is perhaps the outstanding illustration of the disproportionate handling of the material. Twenty-two pages are given an excellent, profusely illustrated discussion of diaphragmatic hernia, which is certainly not a common surgical condition. All other varieties of hernia, inguinal, femoral, umbilical and incisional, as well as diastasis recti, are handled in 23 pages which contain only six illustrations (none

strikingly good), all on inguinal hernia.

The list of editors of *British Surgical Practice* includes many eminent names. The material, within the spatial limitations, is generally well presented, though American surgeons, naturally, would not be in agreement with it upon all points. But the whole project seems of somewhat doubtful value. If volume 4 is typical, an experienced surgeon would not find the series at all useful and an experienced surgeon could not possibly gain enough from it to help him. The book is handsomely printed, but one cannot help wishing that some of the space wasted by the format—the very wide margins, to permit detailed marginal headings, and the style of the pages occupied by the index and listing the contributors and their titles—had been conserved and had been utilized to supply more information on the various subjects discussed.

FREDERICK FITZHERBERT BOYCE, M. D.

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*Current Therapy*: Edited by Howard F. Conn, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp. 672. Price, \$10.00.

This book is a good addition to the armamentarium of the busy practitioner. To quote from the preface, "In this book for the first time an attempt has been made to furnish . . . not only the latest but a method endorsed and currently used by a competent authority."

Over 200 leading American physicians have contributed to this volume. The facts are presented briefly and pointedly. Several tables of references and a good index make fact finding a simple task.

The book measures 11" x 8" and the print is of a large, good type. This should greatly facilitate its use. It is a fine desk reference. It covers the



field of medicine and its allied specialties, and does it in a most satisfying manner.

I. L. ROBBINS, M. D.

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*Medicine Throughout Antiquity:* By Benjamin Lee Gordon, M. D.; with a foreward by Dr. Max Neuburger. Philadelphia, F. A. Davis Co., 1948. Pp. 818, illus. plates. Price, \$6.00.

Written for lay readers as well as for physicians, Dr. Gordon's book presents in an unusually interesting fashion the early development of medical thought from the days of prehistoric antiquity to the close of the Graeco-Roman period in 476 A. D. The medical practices of antiquity are shown as a link between the beliefs of ancient medical lore and the later centuries of increasing knowledge. Many fundamental discoveries of today are shown to be based on practices which antedate recorded knowledge. Translations of ancient manuscripts are included as evidence of this concept. The march of medicine is presented as a continuous forward movement, sometimes slow, sometimes in increasing tempo, but present progress ever based upon the knowledge of the past.

MARY LOUISE MARSHALL.

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*The Uses of Penicillin and Streptomycin:* By Chester Scott Keefer. Lawrence, Kansas, University of Kansas Press, 1949. Pp. 72. Price, \$2.00.

This book consists of three Porter lectures delivered under the auspices of the University of Kansas School of Medicine by an author well qualified by his broad experience in the field of antibiotics.

In the first lecture "Penicillin in Medical and Surgical Practice" attention is called to the remarkable importance which penicillin has assumed as a therapeutic agent within the few years since it has become available. The various types of penicillin, dosage forms and methods of administration are briefly reviewed. In discussing dosage the difficulty of making categorical statements in the light of present knowledge is recognized. It is pointed out however that organisms are most susceptible to penicillin when they are multiplying most actively. Thus, concentrations of penicillin within the body should be high enough to eliminate

the most susceptible organisms within a short period of time and maintained sufficiently long for the more resistant organisms to recover and again to start multiplying rapidly. It is more important to maintain an optimal concentration for a prolonged period than a very high concentration for a short period of time although apparently optimal concentrations need not necessarily be continuous over a 24 hour period. This latter concept offers a rationale for the longer dosage intervals which have proved to be effective in some infections. In the author's opinion the widespread use of penicillin has not led to the production of a large number of penicillin resistant organisms and the risk of producing such strains seems to be minimal. The reactions to penicillin and the results of therapy in a variety of conditions are reviewed.

The second lecture is entitled "Streptomycin in the Treatment of Infections." The nature of the streptomycin complex and the chemistry of the important constituents are described. Information is provided on the susceptibility of various organisms and the occurrence of side reactions is discussed. The response to streptomycin therapy in various diseases is briefly considered with special attention being given to the therapy of tuberculosis.

The third lecture "Antibacterial Agents from Microbes" is of an historical nature concerning the work of Dubos, Fleming, Waksman and their co-workers in the development of tyrothricin, penicillin and streptomycin. It is of interest to learn that the demonstration of antibacterial agents from microbes dates back to the researches of Pasteur and Metchnikoff with other contributions of similar nature intervening between that time and the discovery of the agents used at present.

Although the limited treatment does not allow an exhaustive review of penicillin and streptomycin the reader will be well rewarded by an evening spent with this well written and informative book.

RALPH G. SMITH, M. D.

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*Doctors of Infamy:* By Alexander Mitscherlich, M. D., and Fred Mielke. New York, Henry Schuman, 1949. Pp. 172, illus. Price, \$3.00.

This is the story of the Nazi medical crimes with statements by three American authorities identi-

fied with the Nuremberg medical trial. The book is illustrated with 16 pages of photographs. The authors, who are Germans, voluntarily composed the book from authentic data and eye witnesses. The contents, in a general way, are known to most informed people, but it certainly behooves each and every individual to read this small book to realize the enormity of these inhuman crimes perpetrated in the name of medical science, and which American as well as all other scientists state were entirely devoid of any conclusions beneficial to the advance of medical knowledge.

I. L. ROBBINS, M. D.

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*Child Health Services and Pediatric Education:* By American Academy of Pediatrics, Committee for the Study of Child Health Services. New York, Commonwealth Fund, 1949. Pp. 270. Price, \$3.50.

The American Academy of Pediatrics has undertaken a program which has as its stated objective: "preventive, diagnostic, and curative medical services of high quality, which, when used in cooperation with other services for children, will make this country an ideal place for children to grow into responsible citizens." As the first step toward this objective a true picture of the present facilities for child health was necessary before intelligent positive action for improvement could be undertaken. This report is a factual summary of existing facilities.

The book is in two parts. Part I brings out the highlights of factual information related to private practice, hospital facilities and the services of community health agencies. Part II deals with an evaluation of pediatric education at the undergraduate, graduate, and post-graduate levels.

The average practitioner who is in any way concerned with any bureaucratic direction of his practice should be vitally interested in his attempt of a group of doctors to seek facts as to the adequacy of the present status of medical care for children.

JAMES U. MORRISON, JR., M. D.

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*Aesculapius Comes to the Colonies:* By Maurice Bear Gordon, M. D. Ventnor, N. J., Ventnor Publishers, Inc., 1949. Plates illus. Pp. 560. Price, \$10.00.

This story of the early days of medicine in the thirteen original colonies describes each medical condition as it existed prior to the American Revolution. Many pertinent documents dealing with local medical history are reproduced. Portraits and sketches of the principal physicians are included. An excellent index aids in making this volume a valuable reference tool for the further study of American medicine.

MARY LOUISE MARSHALL.

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*Neurological and Neurosurgical Nursing:* By C. G. de Gutiérrez-Mahoney and Esta Carini. St. Louis, C. V. Mosby, Co., 1949. Pp. 516, illus. Price, \$5.75.

The most remarkable thing about this book is that it actually was written for nurses. So often textbooks for nurses are nothing more than medical texts written down to what the author vaguely considers the nurse's "level." The author physician and his nurse co-author have presented only those facts concerning neurologic disorders which are essential for intelligent nursing. This book is not a text of neurology. The nurse is taught to practice nursing, not medicine. Instructions relative to spinal puncture, for example, are minute. With this book as a guide a nurse could set up for, and assist with, a spinal puncture without ever having seen one performed and without any concern about interpreting the results.

The nurse's role in the medical and surgical management of diseases of the nervous system makes up the body of the text. The appendix contains the outline for a comprehensive set of lectures including the history of neurologic nursing. A reading list, not the author's bibliography, as well as a glossary are appended. Any school of nursing could begin to teach neurologic nursing with a minimum of effort on the part of the instructor.

The book is cloth bound, of convenient size and amply illustrated. Nothing is left to the nurse's imagination—a sufficient recommendation in itself.

FREDERICK C. REHFELDT, M. D.

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*Psychosomatic Medicine:* By Edward Weiss, M. D. and O. Spurgeon English, M. D. 2d ed., Philadelphia, W. B. Saunders Co., 1949. Pp. 803.

We can no longer deny the need for a good text on this all important problem. The first edition of this book was good enough to establish it as a



classic. This will be a "must" volume to those who would bring to bear "The clinical application of psychopathology to general medical problems."

I. L. ROBBINS, M. D.

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#### PUBLICATIONS RECEIVED

The Blakiston Company, Philadelphia: Shearer's Manual of Human Dissection, Edited by Charles E. Tobin, Ph. D. Blakiston's New Gould Medical Dictionary, Edited by Harold Wellington Jones, M. D., Norman L. Hoerr, M. D., Arthur Osol, Ph. D.

The Commonwealth Fund, New York: Supplement to Child Health Services and Pediatric Education, Report of the Committee for the Study of

Child Health Services, The American Academy of Pediatrics.

Grune & Stratton, Inc., New York: Progress in Neurology and Psychiatry, An Annual Review, Volume IV, Edited by E. A. Spiegel, M. D.

Harper & Brothers, New York: America's Health, by The National Health Assembly.

The Linacre Press, Inc., Washington, D. C.: Marihuana in Latin America, The Threat it Constitutes, by Pablo Osvaldo Wolff, M. D., Ph. D., M. A.

W. B. Saunders Company, Philadelphia: A textbook of Neuropathology, by Ben W. Lichtenstein, B. S., M. S., M. D.

Charles C. Thomas, Springfield, Ill.: Radiologic Exploration of the Bronchus, by S. DiRienzo, M. D.

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## THE PHARMACOLOGY OF ANTI- COAGULANT AGENTS\*

RALPH G. SMITH, M. D.†

NEW ORLEANS

The anticoagulants of current interest in the management of thrombosis and embolism are heparin and dicumarol. It is the purpose of this brief review to present the important aspects of their chemistry and pharmacologic actions. More detailed discussions may be found in the reviews of Quick<sup>1</sup> and of Prandoni and Wright<sup>2</sup> which have appeared within the past few years.

### HEPARIN

Thirty-three years have elapsed since McLean<sup>3</sup> extracted an anticoagulant from liver to which the name heparin was applied by Howell and Holt<sup>4</sup> in 1918. In the intervening time our knowledge of this substance has gradually developed. It is, however, still incomplete due, in part at least, to controversies which still exist regarding the details of the normal clotting mechanism.

*Chemistry:* Heparin is a complex organic polymer, the exact structure of which has not been established. As a result of the work of Jorpes and Bergström<sup>5</sup> and of Charles and Todd<sup>6</sup> it is known to have the structure of a mucoitin polysulfuric acid. In more detail, the factor contains a basic

tetrasaccharide unit consisting of two molecules of acetylated glucosamine and two molecules of glycuronic acid. This tetrasaccharide is esterified with possibly a variable number of sulfuric acid groups resulting in a strongly acidic and electro-negative compound which has the property of forming stable salts with proteins. It has been suggested that this property offers an explanation for its actions in that it may modify the actions of the protein enzymes concerned in the coagulation of blood. This property also leads to its binding and inactivation by highly basic proteins such as protamine. The possibility exists that heparin is not a single chemical entity but may be a mixture of closely related compounds. This might explain the difference in potencies of heparins isolated from various species.<sup>7</sup> Stable sodium and barium salts of heparin are readily prepared.

*Action:* Heparin in itself is only weakly, if at all, anticoagulant, as may be demonstrated on purified clotting factors of blood<sup>8, 9</sup>. In the presence, however, of a cofactor of normal plasma or serum, heparin is a powerful anticoagulant. This cofactor, although still not definitely identified, is in the most soluble of the serum albumin fractions. Apparently it is possible for heparin to act at two stages of the clotting process. It was originally described by Howell and Holt<sup>4</sup> as an antiprotease. This property has been confirmed by Brinkhous and co-workers.<sup>9</sup> In other words, it prevents the formation of thrombin from prothrombin. The exact mechanism of this

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\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 6, 1949, in New Orleans.



action is still problematic, although Quick<sup>1</sup> is strongly of the opinion that it does not counteract the action of thromboplastin. Heparin is also an antithrombic agent in the presence of a normal cofactor of serum.<sup>10</sup> There is considerable evidence that this co-factor may be the normal antithrombin the action of which is catalyzed by heparin.<sup>1</sup>

The anticoagulant action of heparin is rapid and is transitory. An intravenous injection of a single dose sufficient to prolong the coagulation time to thirty minutes has a latent period of only a few minutes and the action wears off in from two to three hours. A minor portion is excreted in the urine<sup>11</sup> but most of it is unaccounted for, possibly being destroyed by an enzyme heparinase which has been found in body tissues.<sup>12</sup>

A number of secondary actions of heparin may be briefly mentioned. It inhibits the agglutination of platelets and the accumulation of white thrombi both in vitro and in vivo. This may be an important action in preventing the beginning of thrombus formation.<sup>13</sup> It also increases the resistance of erythrocytes to hypotonic salt solutions and inhibits the action of complement. Consequently, its presence may be a disturbing factor in fragility tests and in certain serological reactions.

*Physiological Significance:* Heparin is presumably produced by the mast cells of Ehrlich found in the connective tissue surrounding the blood vessels, being particularly abundant in the vena cava. The lungs, liver, and cornea are rich in mast cells, and other tissues contain them in varying amounts. The evidence for this site of formation is as follows. A characteristic staining reaction given by heparin with toluidine blue is also given by the granules of the mast cells with this dye. It is also of interest that in a number of tissues a parallelism exists in the abundance of mast cells, the crude heparin content, and the concentration of ester sulfates. The stores of ex-

tractable heparin, particularly in the lungs and liver, suggest that it has a physiological function, but this has not been established. In certain abnormal states, however, increased amounts of heparin have been demonstrated in the blood. In peptone and anaphylactic shock, heparin is released into the blood stream decreasing the coagulability of the blood as demonstrated by Jaques and Waters in dogs.<sup>14</sup> An interesting corollary to this is the fact that heparin inhibits in vitro the release of histamine from blood cells to plasma caused by trypsin, protease or a specific antigen<sup>15</sup> An increase in the heparin content of the blood also results from ionizing irradiation<sup>16</sup> and by nitrogen mustard,<sup>17</sup> as shown by Allen and his colleagues. There is, however, much to be learned concerning the significance of these observations.

Heparin for clinical use is prepared from lung or liver tissue. It is available as a solution of the sodium salt in sterile 10 cc. ampules containing 10 mg. per cc. and of a potency not less than 100 units per mg. of the dry material. Heparin may be sterilized by boiling or by autoclaving at 110° C. for not over thirty minutes. Sterile solutions in ampules keep indefinitely. It is inactive when administered orally. The above aqueous preparations are administered intravenously. Certain preparations have been prepared in special menstrua for subcutaneous<sup>18</sup> and for intramuscular<sup>19</sup> injection.

For the purposes of assay or standardization, a pure preparation of the barium salt of heparin prepared by the Toronto group has been used, to which a potency of 100 units per mg. was assigned. This unit is approximately five times as large as the original Howell unit. There is now available a provisional international standard of the sodium salt of heparin of a potency of 130 units per mg. Several methods are available by which the commercial preparations may be assayed by comparison with the standard.

## DICUMAROL

The story of the development of our knowledge of dicumarol is a familiar one. A hemorrhagic disease in cattle resulting from the eating of spoiled sweet clover was described by Schofield<sup>20</sup> over twenty-five years ago. Roderick<sup>21</sup> in 1931 made an important contribution by showing that prothrombin was the deficient coagulation factor in this condition. This point was confirmed ten years later by Link and his associates who proceeded to isolate and crystallize the hemorrhagic agent<sup>22</sup> and then to identify it chemically and to synthesize it.<sup>23</sup> Since that time the compound has been available for clinical use.

*Chemistry:* Dicumarol is a white or slightly buff colored crystalline solid, practically insoluble in water but forming soluble salts with alkalis. Chemically it is 3,3'-methylene-bis-(4-hydroxycoumarin). Coumarin itself is a compound widely distributed in the vegetable kingdom. When fused with potassium each molecule of dicumarol yields two molecules of salicylic acid.

*Administration and Metabolism:* Due to its low solubility in water except in alkaline solution it is not well suited for parenteral injection. It is, however, well absorbed on oral administration, although at a rather slow rate<sup>24</sup> and apparently is absorbed to some extent when administered by rectum.<sup>25</sup> In the plasma it is almost completely bound by protein and is bound to a high degree in the tissues. It is slowly metabolized and only traces appear as such in the urine.<sup>24</sup>

*Action:* As previously stated, dicumarol impairs the clotting mechanism by reducing the prothrombin content of the blood. Apparently it does not destroy prothrombin since unlike heparin it is inactive *in vitro*. The evidence points to an inhibition of the synthesis of prothrombin by the liver possibly by an interference with the utilization of vitamin K<sup>1</sup>. It is also known that massive doses of vitamin K or its analogues are at least partially effective in counteracting the action of dicumarol. Quick<sup>1</sup> believes that prothrombin consists of an un-

stable component A linked by calcium with a stable component B, and it is the latter stable component which is decreased by dicumarol. This opinion has been disputed.<sup>26, 27</sup> More recently MacMillan<sup>28</sup> has presented evidence suggesting that the decrease in prothrombin produced by dicumarol is only apparent and that it is a prothrombin accelerator which is deficient.

In any case, dicumarol administration causes a fall in the prothrombin activity of the blood. The prothrombin time which is used to measure the dicumarol effect increases only slowly until the prothrombin activity decreases to approximately 30 per cent of normal. It then begins to increase at a much more rapid rate.

Unlike heparin, dicumarol produces a slow but persistent response. There is a latent period of at least twelve to twenty-four hours. Complete action is evident over the course of three to four days after administration, following which it gradually declines. This is in keeping with the mechanism of action of the drug. After it blocks the formation of prothrombin in the liver the blood content must be gradually depleted. A critical minimum dose is necessary to produce a marked effect but greatly increasing the dose above this value will not hasten the result.<sup>1</sup> Following the action of dicumarol on the liver, that organ must restore the blood prothrombin before normal coagulation is possible. In contrast, heparin which acts on the clotting mechanism in the blood, acts almost at once, and since it is quickly destroyed and excreted the action is evanescent.

Like heparin, dicumarol has been reported to inhibit platelet adhesiveness<sup>29</sup> which may be an additional beneficial action in the prevention of thrombosis.

*Toxicity:* The danger from dicumarol as used clinically is limited to hemorrhagic manifestations. Apparently the action on the liver is specifically against prothrombin production since liver function tests have shown no impairment to that organ in clinical cases nor has liver injury been found in animals at autopsy after moderate doses. It has been reported, however, that patients



with cirrhosis of the liver and rats with liver injury due to carbon tetrachloride show increased sensitivity to dicumarol.<sup>1</sup> With large repeated doses resulting in death, central necrosis of the liver was frequently found in rats and occasionally in rabbits, mice and dogs.<sup>30</sup> Acute lethal doses in animals are of the order of 40 mg. per kg. Dogs die in circulatory collapse without hypoprothrombinemia. Hyperglycemia and a rise in metabolic rate and rectal temperature occur.<sup>31</sup> Capillary dilatation after large doses in animals has been observed by several investigators. Such findings, however, from the standpoint of dosage, hardly apply to the clinical use of the drug where the main concern is to produce a limited hypoprothrombinemia.

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## TREATMENT AND PREVENTION OF PULMONARY EMBOLISM, VENOUS THROMBOSIS AND OTHER THROMBO-EMBOLIC EPISODES

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The value of anticoagulants in the prevention and treatment of vascular thrombosis and embolism has been well established. If there were a single inexpensive laboratory determination that would allow us to predict the danger of thrombosis in an individual patient, the problem would be simple. Until such a determination is available, we can only give prophylactic anticoagulants to those patients whose disease increases their chances of a thrombo-embolic complication.

In an autopsy study of 370 cases of pulmonary embolism, Hampton and Castleman<sup>1</sup> found 60 per cent occurring in medical cases, 30 per cent of the total in patients with heart disease. In a study of 2613 autopsies, Burke<sup>2</sup> found 648 (24 per cent) to have thrombosis. Four hundred and twenty-seven of the thromboses occurred in strictly medical cases, of which 203 had various types of cardiac disease as the primary condition and 135 more as an important secondary condition. Hines,<sup>3</sup> in an au-

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opsy study of 234 cases of heart disease, found that gross pulmonary embolism occurred 81 times (35 per cent), yet a clinical diagnosis of pulmonary infarction was made only twice.

Because heart disease is such a prominent finding in most studies of thrombo-embolism, many physicians have advocated giving prophylactic anticoagulants to this group of patients when they become bedridden.

Nichol,<sup>4</sup> Peters *et al*,<sup>5</sup> Wright,<sup>6-7</sup> and others have made control studies of the administration of prophylactic dicumarol to cases of acute myocardial infarction with a significant reduction in the mortality and incidence of thrombo-embolism. Similar studies using cases of congestive failure have been undertaken.

Methods of preventing thrombo-embolism as advocated by our surgical colleagues are not applicable to most medical cases.

In the past two and one-half years, we have had the opportunity to administer anticoagulants to a number of patients in the Charity Hospital at New Orleans. The following is a summary of the study.

#### CONGESTIVE FAILURE

We set out to study two groups of patients, employing dicumarol in those of one group in addition to the usual methods of therapy, and using those of the other group as controls. During the study there developed, however, a third group of considerable size, made up of patients in whom the prothrombin activity was initially reduced to 50 per cent (or less) of normal, and who were, therefore, not given dicumarol.

*Occurrence of Thrombo-Embolism.* In the treated group of 147 cases of congestive failure, there were 11 deaths (7.4 per cent mortality) with 3 autopsies which did not reveal the presence of thrombi or emboli. There were only 2 cases that were suggestive of a thrombo-embolic complication.

Of the 38 "low" cases, there were 6 deaths (15.8 per cent mortality); 2 were autopsied and 1 found to have a pulmonary embolus.

In the control group of 150 cases of congestive failure, there were 20 deaths (13.3

per cent mortality); 8 were autopsied, 7 (35 per cent) having serious emboli. An additional 6 of the fatal cases were suspected of having a thrombo-embolic complication, but no autopsy was permitted. If the definite and suspected cases are combined, thrombo-embolism may have played a part in 65 per cent of the fatal cases in the control group (Table 1).

TABLE I

#### OCCURRENCE OF THROMBO-EMBOLISM IN 150 CONTROL CASES OF CONGESTIVE FAILURE

A. Fatal Cases	
I. Autopsy Diagnosis	
1) Pulmonary emboli with infarction	4
2) Multiple cerebral emboli with infarction	1
3) Mesenteric thrombosis with infarction	1
4) Bilateral auricular thrombi	1
	—
	7
II. Clinical Diagnosis (not autopsied)	
1) Pulmonary infarction	1
2) Expired suddenly	5
	—
	6
B. Non-Fatal Cases	
1) Pulmonary embolism (2 treated)	3
2) Thrombophlebitis	1
	—
	4

11.3 per cent incidence of thrombo-embolism in 150 cases of congestive failure.

The total incidence of definite and suspected thrombo-embolism occurring in the 150 control cases of congestive failure was 11.3 per cent, as compared to 1 per cent in the 147 cases of congestive failure given prophylactic dicumarol.

#### MYOCARDIAL INFARCTION

Our series consists of 58 cases treated with anticoagulants and 144 controls obtained by a five year review of the Charity Hospital records. Only those cases that had unequivocal electrocardiographic evidence of a fresh myocardial infarction accompanied by a compatible history were included in the study. Those patients who were in the hospital less than three days were excluded. All electrocardiographic interpretations were made by members of the Charity Hospital Heart Station.

*Results.* There were 12 deaths (20.6 per



cent mortality) in the 58 anticoagulant treated cases, and 38 deaths (26.3 per cent mortality) in the 144 control cases.

Six (50 per cent) of the 12 fatal treated cases were autopsied and only 1 case was found to have a thrombo-embolic complication. This patient had luetic aortitis with subacute bacterial endocarditis (undiagnosed antemortem) in addition to a myocardial infarct. There was a ball valve thrombus attached to the aortic valve which caused intermittent closure of the mouth of the left coronary artery. This thrombus was undoubtedly present before treatment, as it gave rise to the myocardial infarction.

Fourteen (37 per cent) of the 38 fatal cases of the control group were autopsied and definite thrombo-embolism occurred in 8 (7 pulmonary emboli and 1 mesenteric infarction). Thrombo-embolism occurred in 4 cases not autopsied, 2 experiencing a cerebral embolus and 2 a pulmonary embolus.

Forty-six treated cases survived and experienced no suspected thrombo-embolic episode. One hundred and six of the control group survived, one experiencing a femoral artery embolus and the other thrombophlebitis of the leg.

The total incidence of thrombo-embolism in the 144 control cases of fresh myocardial infarction was 9 per cent.

In 38 deaths of the control group there were 14 autopsies (37 per cent). Definite thrombo-embolism occurred in 12 (31 per cent) of the fatal cases in the control group.

#### THROMBOPHLEBITIS

This series is comprised of 57 cases. Twenty were complications of a medical condition, 18 entering the hospital because of congestive heart failure. Twenty-five followed surgical procedures, and 12 had no obvious etiologic cause.

Fourteen patients experienced a pulmonary embolus before anticoagulants were started. Four patients had bilateral superficial femoral vein ligation before anticoagulants were started.

*Results.* One patient continued to have pulmonary emboli though he received a bilateral superficial femoral vein ligation and anticoagulants. Autopsy revealed wide-

spread metastatic carcinoma of the pancreas. Anticoagulant failure has been previously noted in carcinoma of the pancreas.

Two patients had pulmonary emboli on the second and sixth days, respectively, of anticoagulant therapy; both survived.

One patient had a recurrence of thrombophlebitis and pulmonary embolism on the eleventh day after discharge. He had remained in bed at home. It is well known that anticoagulants should be continued until the patient is fully ambulatory.

In 33 cases there was no major illness which prevented the patient from becoming ambulatory as soon as the leg edema, temperature and pulse rate subsided. In these 33 cases the average day of ambulation was 8.5 days.

*Residual.* In most cases our follow-up was within the first month after discharge. Three required ace bandage. One had moderate swelling and 9 had slight swelling.

In 57 cases of thrombophlebitis treated with anticoagulants, 4 experienced further thrombo-embolic complications (7 per cent). There were 3 deaths, 2 from uremia and 1 from metastatic carcinoma of the pancreas complicated by thrombo-embolism.

#### PULMONARY EMBOLISM

In the last eighteen months we have treated 46 cases of pulmonary embolism. Fifty-four per cent occurred in strictly medical cases, and 46 per cent in surgical cases. Thirty-six cases were considered as definitely having experienced a pulmonary embolus, 5 probably, and 5 possibly. Twenty of the 25 medical cases had congestive heart failure upon admission; the remaining 5 had thrombophlebitis.

Eleven cases received emergency therapy of atropine and papaverine in addition to anticoagulants. All cases except 9 received heparin in addition to dicumarol until the prothrombin activity was reduced to the therapeutic range.

Further embolization after anticoagulant therapy occurred in five patients (10.8 per cent) at two hours; four hours; thirty hours (probable); sixth hospital day; and the fifth case expired (metastatic carcinoma of the pancreas).

There were 3 deaths in the definite group and 1 in the possible group, giving a mortality of 8.7 per cent.

Fifty per cent of the patients became ambulatory in ten days or less. The longest stay in bed was twenty-four days.

Those who survived and were discharged had no further thrombo-embolic complications except 1 patient who remained in bed at home eleven days and experienced another pulmonary embolus.

#### PELVIC THROMBOPHLEBITIS

This group is comprised of 6 cases. The first 3 cases treated had serious multiple pulmonary emboli and were too ill to have a vena cava ligation. The good results obtained with these three resulted in the Gynecology Service giving us 3 additional patients who were not critically ill. All 6 recovered with no sequelae.

#### ARTERIAL EMBOLI

This group is comprised of 3 cases who had one cerebral and two femoral emboli, respectively. All 3 had auricular fibrillation. After anticoagulants were given the mechanism was returned to normal with quinidine.

#### SUMMARY

1. In a control group of 150 cases of congestive heart failure the mortality was 13.3 per cent as compared to 7.4 per cent in 147 cases given prophylactic dicumarol.

2. Thirty-five per cent of the fatal cases in the control group of congestive failure definitely had a thrombo-embolic complication as proven by autopsy.

3. There was an 11.3 per cent incidence of thrombo-embolism in 150 control cases of congestive failure.

4. There were 2 cases of suspected thrombo-embolism in 147 cases of congestive failure treated with dicumarol.

5. In a control group of 144 cases of fresh myocardial infarction, the mortality was 26.3 per cent as compared to 20.6 per cent in 58 cases given prophylactic anticoagulants.

6. Thirty-one percent of the fatal cases in the control group of myocardial infarction definitely had a thrombo-embolic complication as proved by autopsy.

7. There was a 9 per cent incidence of thrombo-embolism in 144 control cases of myocardial infarction.

8. There was 1 case of probable thrombosis in the 58 cases of myocardial infarction given prophylactic anticoagulants.

9. The results in the treatment of thrombophlebitis with anticoagulants have been excellent.

10. In 46 cases of pulmonary embolism treated with anticoagulants the mortality was 8.7 per cent.

#### CONCLUSIONS

Our experience with the use of anticoagulants in a large number of cases confirms the experience of others in that heparin and dicumarol are effective in the prevention of vascular thrombosis and in the prevention and treatment of arterial and pulmonary embolism. In congestive heart failure the use of dicumarol prevented thrombo-embolic complications except in 2 possible cases, and effected a reduction in mortality which is probably significant and which can be attributed entirely to the prevention of thrombo-embolic complications. In our series of myocardial infarction there was no evident lowering of mortality from the use of anticoagulants, but in this connection it should be noted that our control series did not consist of parallel cases and it should also be noted that in the cases treated with heparin and dicumarol no thrombo-embolic complications were observed. Our results in the treatment of thrombosis of the leg veins have been good. Our statistics indicate a considerable lowering of mortality in cases of pulmonary embolism, there being only 4 deaths in a series of 46 cases. Six patients with septic phlebitis of the pelvic veins and 3 cases of arterial embolism were treated without mortality.

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## SYMPOSIUM ON RICKETTSIAL DISEASES

### CLINICAL ASPECTS OF RICKETTSIALPOX, Q. FEVER AND ROCKY MOUNTAIN SPOTTED FEVER\*

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It is obviously impossible to cover all of the clinical features of rickettsial infection in a brief presentation. This discussion, therefore, will be confined to certain aspects of rickettsial disease which constitute recent advances in our knowledge of this complicated field, and which may be of present or future importance to physicians in this geographical area. Under such an elastic heading we will consider two rickettsial infections which are relatively new diseases, Rickettsialpox and Q. fever, and one older and more malignant ailment, Rocky Mountain spotted fever, which has steadily increased in importance in this country during the past decade and is now a more urgent problem for prompt diagnosis because of the availability of curative methods of treatment.

#### RICKETTSIALPOX

During the month of June 1946, an explosive epidemic of an unidentified disease swept through a housing development occupied by several hundred families in an isolated part of Queens County in New York City. The physician whose general practice included many of the families living in this area promptly recognized that he had something new on his hands, and an

investigation which involved the joint efforts of the U. S. Public Health Service and the City Health Department was soon under way. Out of this investigation came, within a surprisingly short time, an almost complete picture of the clinical features, etiology, and mode of transmission of a brand new rickettsial disease.<sup>1,2</sup> In all, 144 cases were reported from the single housing development, and within the next few weeks about 50 other cases were detected in other parts of New York City. Moreover, shortly after the disease became publicized in the city, numerous physicians in other counties realized that they had been seeing within recent years sporadic cases of a precisely similar clinical syndrome. It is quite likely that the disease has existed in an unrecognized form for some time. There is no reason to assume that it will remain confined to the New York area for long, and indeed we may already have had it in this region without realizing it. Hence, a familiarity with the pertinent clinical features of rickettsialpox should be of value.

The disease began—although the patients were not yet aware that they were ill—with a single skin lesion which has been referred to as the “initial lesion”. Most of the patients thought that they had developed a small boil; in some it was no more noticeable than a pimple. This lesion usually appeared on one of the covered parts of the body, and represented in all probability the site of original infection by the mite responsible for transmitting the disease. It started as a small, round, firm, dark red papule which grew in size, became vesiculated in the center, and then formed a dry black eschar. The skin surrounding the initial lesion was sometimes reddened but not indurated. Usually the regional lymph nodes were enlarged and moderately tender. The lesion usually lasted three or four weeks, sometimes considerably longer than the disease itself.

Not all patients were aware of the existence of the primary lesion, but in the series reported by Greenberg *et al.*<sup>3</sup> a careful inspection of the body revealed a lesion in 95 per cent of cases.

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About one week after the appearance of the initial lesion, the disease itself began. Like most rickettsial infections, the onset was very sudden and was characterized by chills, fever, weakness, and pain in the back. A temperature of 103° or 104° F. was common at the outset. In most cases the fever persisted, with morning remissions, for about a week, after which it gradually returned to normal. Chills were observed to occur during the first two or three days, sometimes with two or three chills each day. Headache was a prominent symptom in 90 per cent of the cases. Other symptoms included diffuse muscle pains, lassitude, photophobia, and in a few patients, persistent nausea and vomiting.

Sometime during the second, third, or fourth day after the onset of these symptoms, the rash made its appearance. In some individuals, the rash was noted at the same time as the first symptoms.

The characteristic rash of rickettsialpox consisted of discrete, red, maculopapular lesions which were firm to the touch. The base of each lesion was usually circular, and measured between 2 and 8 millimeters in diameter. These lesions appeared on the trunk, face, and extremities, and the pattern of their distribution varied considerably from patient to patient. Lesions were not noted on the palms or soles. In two patients lesions occurred on the palate and tongue.

Within twenty-four to forty-eight hours after the appearance of the papules, the lesions formed small vesicles at their summits; these vesicles were firm and were described as having the appearance of a "window" in the top of the papule. After several days the vesicles dried with a black crust, which was later discharged without leaving a scar.

In a few cases the spleen was palpable. Generalized lymphadenopathy was not observed.

All of the patients recovered without sequelae, and in most instances recovery was complete by the seventh to tenth day. Except for a mild leucopenia there were no significant laboratory abnormalities. Diag-

nosis was accomplished by the isolation of the causative agent from the blood, and by the demonstration of a specific complement-fixing antibody during convalescence.

In summary, rickettsialpox is an acute febrile disease which is characterized by an initial single pustular lesion of the skin, followed by a generalized eruption which is at first maculopapular and later becomes vesicular. It is obvious that if such an illness were observed in its sporadic form, it might be mistaken for chicken pox, and indeed, this happened in some of the early cases in the New York outbreak. However, the vesicle of varicella is elevated, superficial, and easily ruptured, while in rickettsialpox it is partially submerged within the papule. The presence of this disease in the United States should lead to a painstaking examination of all cases of "atypical" chicken pox, especially in adults and when the appearance of the rash is preceded by a sudden onset of fever a day or so earlier. Under such circumstances, the initial pocklike lesion should be sought for with care. In any case in which the diagnosis is suspected, special laboratory procedures should be undertaken which are similar to those used for the diagnosis of other types of rickettsial disease.

It is unlikely that this disease will often be confused with smallpox, in view of the relative mildness of rickettsialpox and the failure to develop a frankly pustular rash with the geographic pattern of smallpox. The vesicular character of the rickettsialpox lesion enables its differentiation from all other types of known rickettsial disease, including epidemic and endemic typhus, Rocky Mountain spotted fever, scrub typhus, and the Mediterranean disease known as Boutonneuse fever.

Concerning treatment of rickettsialpox little can be said at the present time. The organism is susceptible to both aureomycin and chloromycetin, and in the event of a new outbreak one of these substances would be indicated.

#### Q. FEVER

The second rickettsial infection which is still new to many of us, and which bids fair



to become of increasing importance in our population, is Q. fever. This disease differs from all other known rickettsial infections in its failure to produce skin lesions of any sort and in its particular predilection for the lungs. The disease which it most closely resembles and with which we are most apt to confuse it is primary atypical (or "virus") pneumonia.

Q. fever was first recognized in Queensland, Australia, in 1935<sup>1</sup>, and a short time later a similar agent was isolated from naturally infected ticks in this country.<sup>5</sup> Except for frequent and sometimes spectacular infections among laboratory workers—entire institutes have contracted the disease—the illness appeared to be of no great significance until 1944 and 1945, when more than 1,000 cases suddenly occurred among Allied troops in the Mediterranean theatre.<sup>6</sup> Subsequently, new cases have occurred in this country among returned military personnel, and also among civilians, and the disease may be presumed to have gotten a firm foothold in some parts of America. In March 1946, an outbreak of Q. fever occurred among stock handlers and slaughterhouse workers in Amarillo, Texas.<sup>7</sup> At the present time, Q. fever is generally regarded as a potential epidemic disease of major importance, and there is every reason to believe that we will be seeing some of it here in Louisiana.

The disease begins, typically, after an incubation period of between two and three weeks, with an abrupt onset of headache, fever, and generalized body pains. The headache is severe and intractable and is often the complaint which brings the patient to his physician. During the first few days these are the only complaints, and the temperature ranges between 101° and 104° F. The pulmonary involvement which characterizes the later stage of Q. fever is not recognizable at this time; there is no cough, and the lungs appear normal by x-ray. After three or four days the x-ray shows patchy areas of consolidation in a portion of one lobe, generally with a ground glass appearance. At about the same time, scattered crepitant rales may be heard over

the involved area, perhaps with slightly impaired resonance. The patient develops a mild cough, usually unproductive, and may complain of vague pains in the chest on the affected side. A few patients become slightly cyanotic, but the dyspnea and respiratory distress of bacterial pneumonia are unusual in this disease. The pulse rate is not as rapid as would be expected with the amount of fever. The white cell count and blood smear are within normal limits.

The illness persists for seven to ten days and usually subsides without complications or sequelae. A few instances of pleurisy and effusion have been described, and arthritis and orchitis have occurred as late complications.

Obviously, such a disease would be difficult to distinguish from primary atypical pneumonia, either by clinical judgment or x-ray study. The differentiation is a laboratory problem, and hinges on the specific serological tests for the identification of Q. fever which will be described in another paper.

Since most cases recover quite readily from Q. fever, specific therapy is not a major problem. In severe infections, either chloromycetin or aureomycin should be effective.

#### ROCKY MOUNTAIN SPOTTED FEVER

In 1899, Maxey,<sup>8</sup> writing in the "Medical Sentinel", of Portland, Oregon, described the disease which we call Rocky Mountain spotted fever as follows: "An acute, endemic, non-contagious but probably infectious, febrile disease, characterized clinically by a continuous moderately high fever, severe arthritic and muscular pains, and a profuse petechial or purpurial eruption in the skin, appearing first on the ankles, wrists, and forehead, but rapidly spreading to all parts of the body." No better nor briefer description of the disease has since been written. During the next several decades it was learned that the fever was caused by a species of rickettsia (*Dermacentroa rickettsi*) and transmitted to man by the bite of an infected tick. The disease has occurred in almost all parts of the country, including forty-three states.

Until very recently it has been one of the most formidable of deadly diseases, with devastating effects on body tissues and a high mortality. It did not respond to treatment with the sulfonamides, penicillin, or streptomycin. Indeed, there is some evidence that sulfonamides actually have an adverse effect in this disease. Owing to the extraordinary generalized vascular injury which characterizes the disease, the patients often perished in a form of medical shock against which large amounts of plasma and blood transfusion were only partly effective. Harrell and his co-workers<sup>9</sup> demonstrated that there occurs a widespread loss of circulating fluid into the tissues, which is attended by a marked fall in blood chloride and an elevation of the NPN to uremic levels. Valiant attempts to combat this disturbance of fluid equilibrium were made in many patients, but the mortality continued to range around 25 per cent or higher. The use of specific antiserum was advocated by Topping,<sup>10</sup> but this was of questionable value after the full development of the disease.

The first promise of specific chemotherapy was offered in 1942, when Snyder and his co-workers<sup>11</sup> showed that paraaminobenzoic acid possessed rickettsiastatic properties. Clinical trials of this drug demonstrated its partial effectiveness in lowering the mortality in Rocky Mountain spotted fever but left much still to be desired by the clinician. It was most effective when given in very large doses, such that blood levels of 50 to 70 milligrams per cent were obtained.

Recently two new antibiotic agents have become available for the treatment of rickettsial disease, and both have been shown to be highly effective against Rocky Mountain spotted fever. These are aureomycin<sup>12</sup> and chloromycetin,<sup>13</sup> either of which is capable of bringing about the subsidence of fever and relief of symptoms within two to three days after administration. Both drugs are given by mouth, and both seem thus far to be almost without toxic reactions other than occasional nausea and vomiting. There is not yet enough evidence

in the literature to allow one compound to be favored above the other in rickettsial infection, and more extensive clinical trials are needed. There is at this time no doubt, however, that either substance is a nearly ideal therapeutic agent in rickettsial disease, and notably so in Rocky Mountain spotted fever. The optimal doses have not yet been firmly established for either drug. Successful treatment has been reported with an initial dose of 60 milligrams per kilogram of body weight, followed by 0.25 grams every three hours until the temperature remains normal for forty-eight hours.

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## THE LABORATORY DIAGNOSIS OF RICKETTSIAL DISEASE\*

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NEW ORLEANS

Rickettsiae are obligate intracellular parasites, that is, they require living cells for their proliferation. This fact is basic to a consideration of the laboratory procedures designed for the confirmation of the clinical diagnosis of the several human diseases caused by these agents. Based on the distinct etiological agent responsible for each of the several types of these diseases and their antigenic relation to one another the following classification will prove most useful for the purpose of this discussion.

TABLE I

1. Typhus Group.
  - a. Epidemic typhus (*R. prowazeki*)
  - b. Murine typhus (*R. mooseri*)
2. Spotted Fever Group.
  - a. Rocky Mountain spotted fever (*R. rickettsi*)
  - b. Boutonneuse fever (*R. conori*)
  - c. Rickettsial pox (*R. akari*)
3. Tsutsugamushi disease or scrub typhus (*R. orientalis*)
4. Q. fever (*R. burneti*)

In the geographic area with which we are immediately concerned murine typhus and Rocky Mountain spotted fever are well recognized. The more recently identified and characterized Q. fever and rickettsial pox should be of considerable concern as the possibility of their occurrence is more than likely in this region. Epidemic typhus may be considered as a more remote possibility and neither boutonneuse fever or scrub typhus are of immediate concern.

The most important factor in the proper diagnosis of murine typhus and Rocky Mountain spotted fever is the early clinical recognition of these diseases. If and when

scrub typhus or rickettsial pox is encountered, the fact that clinicians are aware of the possibility of their occurrence and cognizant of their clinical features will undoubtedly be the first step toward their proper identification.

Early clinical diagnosis is all the more essential in view of the proved efficacy of the more recent therapeutic advances, especially with the development of the antibiotics chloromycetin and aureomycin which have proved effective in these infections. Early treatment is essential and must be instituted before the laboratory can produce the answer which confirms the clinical diagnosis.

It is, therefore, all the more important that the physician understands and properly carries out those procedures upon which successful laboratory results depend. Two main types of procedures for the diagnosis of rickettsial diseases are available: (1) The isolation and identification of the etiological agent and, (2) serological methods.

### ISOLATION AND IDENTIFICATION OF THE RICKETTSIAE

These methods can be performed only where adequate laboratory facilities and considerable experience with these methods are available. The rickettsiae of murine typhus and of Rocky Mountain spotted fever are present in the blood of patients during the early stages, especially the first four to six days of the disease. Inoculation of 3 to 5 c.c. of citrated blood, or more preferably, directly from the syringe with which it is withdrawn from the patients, into male guinea pigs will in about 60 to 75 per cent of instances produce a characteristic febrile disease and a typical scrotal reaction. Clotted blood which is first macerated before inoculation has also been used successfully. The following chart illustrates the type of disease produced and the characteristics which serve to differentiate epidemic typhus, murine typhus and Rocky Mountain spotted fever.

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TABLE II

Differential Characteristics of the Disease Produced in Guinea Pigs Inoculated with Blood from Early Febrile Patients with Rickettsial Infections.

Characteristics	Epidemic Typhus	Murine Typhus	R.M.S. Fever
Scrotal Swelling	none	present without necrosis	present with necrosis
Fever	10-16th day	4th to 8th day (usually moderate)	3rd to 14th day (usually high)
Identification of Rickettsia.	Inoculation of G. P. brain into yolk sac of chick embryo.	Demonstrated in direct stained smear of tunica.	Inoculation of spleen or blood of G. P. into yolk sac or tissue culture.

Q. fever rickettsiae can be isolated by inoculating guinea pigs with blood or urine from patients in the early febrile period. The rickettsiae of rickettsial pox can be isolated in white mice by inoculation of whole blood.

The most generally useful methods for the laboratory diagnosis of rickettsial diseases are serological procedures designed to demonstrate the appearance of specific antibodies in the patient's blood and their increase in titer during the course of infection and convalescence. The best assistance to the clinician can be given if at least three blood samples are submitted to the laboratory, (1) during the first few days of illness, (2) during the second week, and (3) toward the end of the third week. It is of the utmost importance that the laboratory be informed of the period of the disease at which the blood was drawn. One sample of blood is not adequate for proper diagnosis. Several serological tests are

available of which at least two should be run by a well equipped laboratory.

Although the Weil-Felix test is a non-specific reaction it is, nevertheless, frequently used and is sufficiently useful for the early presumptive diagnosis of several rickettsial diseases to warrant continued consideration. In the following table the usual Weil-Felix reactions observed are represented.

	OX19	OX2	OX-K
Epidemic typhus	++++	+	—
Murine typhus	++++	+	—
Scrub typhus	—	—	++++
Q. fever	—	—	—
Rocky Mt. sp. fever	++++	+	—
		or	
		+ + + + +	

The agglutinins for the Weil-Felix antigens are frequently present as early as the sixth day of the disease and practically always by the twelfth day. As such they often provide the first presumptive labora-

TABLE III

The Specific "In Vitro" Serological Tests in Murine Typhus, R.M.S. Fever, Q. Fever and Rickettsial Pox

Type of Disease	Complement Fixation				Agglutination			
	Rickettsial Antigen				Rickettsial Antigen			
	Mur. T	R.M.S.	Q. Fever	R.P.	Mur. T.	R.M.S.	Q. Fever	R. P.
Murine Typhus	+	+	—	—	+	+	—	—
R. M. S.	+	+	—	—	+	+	—	—
Q. Fever	—	—	+	—	—	+	—	—
Rickettsial Pox	—	—	—	+	Not used.			

\*Cross reactions can be eliminated by using rickettsial suspensions repeatedly washed to remove the soluble antigens. \*Considerable cross reactions occur when formalin killed antigen suspension is used.



tory indication of the nature of the disease in question. A positive test on a single blood specimen should not be relied upon unless the test is high, 1-320 or over. The antibodies to the Weil-Felix antigen do not tend to persist longer than several months after convalescence.

The specific serological tests for rickettsial infections depend on the use of antigen suspensions of the distinct types of rickettsial responsible for each form of the disease. These were not available for general use until the yolk sac of the developing chick embryo was found to be suitable for their propagation. The complement fixation test is most generally used and available in most laboratories. Agglutination and precipitin tests are available but not in general use, except for special instances where exact differentiation is required. The preceding table represents the application of the specific serological tests.

The complement fixing antibodies to the rickettsial infections usually appear during the second week of illness. Unlike the antibodies to the Weil-Felix antigen which disappear rather rapidly, these antibodies persist for at least six to eight years. This test, therefore, is useful not only for purposes of diagnosing current infections but is of great value for epidemiological studies.

## PATHOLOGY OF RICKETTSIAL DISEASES IN MAN\*

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NEW ORLEANS

There are several human infections induced by microorganisms called rickettsiae.

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These organisms are intermediate in their characteristics between bacteria and viruses. They are readily seen under the microscope as pleomorphic cocco-bacillary forms. They multiply only within certain cells of susceptible species and are found in various arthropods in nature. On the basis of clinical features, epidemiologic aspects, serologic and immunologic characteristics, these rickettsial diseases of man are divided into the following five groups.<sup>1</sup>

1. Typhus group
  - a. Classic epidemic (louse-borne) typhus, *R. prowazeki*
  - b. Murine (flea-borne) typhus, *R. prowazeki mooseri*
2. Spotted fever group (tick-borne) *R. rickettsi*
3. Scrub typhus (Tsutsugamushi disease) (mite-borne) *R. orientalis*
4. Q. fever (tick-borne) *R. burneti* (*diaporica*)
5. Trench fever (lice) *R. pediculi* (?)

Most of our discussion will concern itself with typhus fever, Rocky Mountain spotted fever, and scrub typhus. The tick-borne, the louse-borne and the mite-borne rickettsial diseases have as their distinctive pathology lesions of the small blood vessels chiefly of the skin and subcutaneous tissues and of the central nervous system. Since the lesions involve for the most part blood vessels microscopic in size, gross lesions are not prominent. The organisms gain entrance to the blood stream and are carried in small numbers to the capillary bed in all parts of the body where they may undergo extensive multiplication particularly in the endothelial cells lining capillaries of the brain, skin and heart.<sup>2</sup> It is the lesion found in the capillaries and the blood vessels of the precapillary size in the skin which produce the eruption noted in these diseases. The rickettsiae are demonstrated fairly easily in sections in Rocky Mountain spotted fever and less easily in epidemic typhus. For this reason one may say that localization of rickettsiae determines the site of the lesion. However, it has been suggested by some authors that indirect, possibly toxic, but more likely hyperergic effects of the rickettsiae, may be important in the pathogenesis of rickettsial pathology particularly in scrub typhus.<sup>3</sup> In scrub typhus, although no adequate attempts have

been made to determine the rickettsiae, the analogies apparent after study of the disease suggest that in mite-borne disease the vascular lesions also follow the localization of the parasite.<sup>4</sup>

The skin and subcutaneous tissues are best for the study of vascular lesions which, throughout the body, are least severe in scrub typhus and most severe in Rocky Mountain spotted fever. In typhus the pathology varies from early swelling of the endothelium of capillaries, arterioles, and venules, to mural and occluding thrombi of fibrin, which occur first in the arteries and veins in the midzone of the corium, and later in the larger arteries and veins in the deepest zone of the corium and subcutaneous fat.<sup>4</sup> Necrosis of skin and subcutaneous tissues occurs in typhus usually only in regions subjected to pressure. In scrub typhus the blood vessel lesions progress but slightly beyond the initial stages of typhus; namely, occlusion of capillaries with perivascular mononuclear cell infiltration. In Rocky Mountain spotted fever necrosis of the media of arteries and veins of the skin and subcutaneous tissues takes place because of invasion of smooth muscle cells by rickettsiae and is independent of stasis produced by pressure. These vessels may have associated thrombosis. This then is reflected in the more hemorrhagic appearance of the rash and more frequent skin necrosis, particularly of the scrotum, fingers, toes, elbows, and ears. The local site of inoculation shows necrosis in scrub typhus. This is considered to be caused by the combined action of the secretion of the larval mite and the inoculated rickettsiae. The vascular lesions and perivascular infiltrations which are present in the surrounding viable tissue are similar to the reaction described elsewhere.

In the above three diseases the changes in the blood vessels within the viscera correspond in severity with those of the skin and subcutaneous tissues. It has been noted that vascular lesions may be found in any tissue or organ and the importance of such lesions varies with their number and the

function of the organ in which the lesions occur.<sup>4</sup>

There is a great deal of interest in the pathologic changes found in the central nervous system. The histopathologic findings include infiltration in the leptomeninges, perivascular accumulation of cells, sharply circumscribed focal lesions or "nodules" of miliary and submiliary size, and slight cerebral edema. The meningeal infiltrations and perivascular accumulation of cells are the same in the three diseases, namely, mononuclear cells, lymphoid cells, and plasma cells. The extent of the pathologic changes in the leptomeninges is greatest in scrub typhus, and least in Rocky Mountain spotted fever.

The "nodules" have been found most frequently in typhus fever, and scrub typhus, and less consistently in Rocky Mountain spotted fever. They may be found in both grey and white matter in typhus fever and scrub typhus but are found most frequently in the grey matter.<sup>5</sup> In Rocky Mountain spotted fever somewhat larger vessels are more often involved and focal areas of demyelination, and microinfarcts are produced.

The cellular composition of these "nodules" varies quantitatively and is influenced by the severity of the initial vascular lesion and by the time of the survival before death. The histologic components of these proliferative foci are predominantly neuroglial cells with few lymphocytes and plasma cells. They are generally considered to be in relation to a blood vessel, although the vessel may not be visible. Qualitatively the "nodules" of scrub typhus and Rocky Mountain spotted fever are similar.<sup>4</sup>

In the heart, the order of decreasing severity of involvement is scrub typhus, typhus, and Rocky Mountain spotted fever. Here we may see swelling of endothelial cells, histiocytes, plasma cells, lymphocytes, and occasional thromboses. These findings may be focal or diffuse.

In the lungs, the diffuse infiltration produces compression and blockage of alveolar capillaries as the cells accumulate inside as well as outside the capillaries. In scrub ty-



phus the reaction is most marked and is usually negligible in typhus. Branchopneumonia of bacterial origin is a common complication in fatal cases.

The kidneys in all three diseases show generalized blood vessel lesions and diffuse cellular infiltrations. We have therefore an interstitial nephritis and may have an early diffuse glomerulo-nephritis manifested by proliferation of endothelial cells with thickening of the basement membrane of glomerular capillaries. The glomerular changes are probably indirect effects either toxic or hyperergic. They are similar to lesions seen in many other infectious diseases.<sup>3</sup>

Lesions of the adrenal cortex are found in all three diseases such as blood vessel changes with associated focal areas of infiltration composed mainly of mononuclear cells. In addition, there are foci of lipid depletion, foci of lymphoid and plasma cell infiltration, and small areas of degeneration of the fascicular zone.

The liver reveals widespread swelling of the endothelium. Large mononuclear cells are usually present between the sinusoids and liver columns and within the periportal spaces. Individual and groups of liver cells may become necrotic and liver cell columns may be disrupted.

The spleen shows marked engorgement, lymphoid depletion of pulp, inactive follicles and a great increase of macrophages in the sinuses and reticular cords. Neutrophils appear late in the course of the disease and earlier if extensive pneumonia is present. In a small percentage of cases, focal areas of necrosis of the pulp may be present.

The lymph nodes in all three diseases undergo some form of hyperplasia with increase in macrophages. In scrub typhus necrosis of lymph nodes may be present.<sup>5</sup>

Q. fever is not accompanied by a rash. Clinically and pathologically it is different from the other rickettsial diseases. Owing to the low mortality, there have been few postmortem studies. In man no important lesions are found outside of the lungs. Pleural effusions are common. The pathologic changes in the lungs are those of a

patchy interstitial pneumonia with considerable exudation. This exudate is composed of fibrin, lymphocytes, plasma cells, large mononuclear cells, and red blood cells. The alveolar walls are infiltrated with mononuclear cells. The respiratory bronchioles and alveolar ducts are also involved in the inflammatory process. One may see organization of the exudate in the alveoli in some areas while early infiltration and exudation may be seen in others.

Trench fever is not a fatal disease and therefore nothing is known about the lesions in the internal organs except that the spleen is enlarged to palpation. The cutaneous lesions show perivascular lymphocytic infiltrations and hyperplasia of the capillary endothelium but no specific changes are present.<sup>4</sup>

Rickettsial pox is a newly recognized disease characterized by an initial lesion caused by the bite of an infected mite. The organism recovered from the mite has been named *Rickettsia akari*. About one week prior to the onset of the fever, a red papule appears at the site of a mite bite and develops into a deep seated vesicle which ultimately shrinks and dries to form a black eschar. The regional lymph nodes usually become enlarged and are tender. A rash appears most commonly at the onset of fever or several days later. Since there have been no deaths, the pathologic picture in man is unknown except for the vascular and perivascular inflammatory changes in the skin. Mice inoculated intraperitoneally may show a small amount of blood tinged peritoneal fluid, enlarged lymph nodes, an enlarged edematous liver, and a dark, engorged spleen eight to ten times the normal size. The respiratory and intestinal tracts show no gross changes.<sup>4</sup>

In conclusion we may say that in general, in rickettsial diseases, the blood vessels are the tissues primarily involved. The first changes are proliferative in character due to actual invasion of cells by rickettsiae. Extravascular accumulations of mononuclear cells also occur about blood vessels in the skin and various other organs. All grossly visible effects are due to lesions of

blood vessels, as exemplified by the rash, the skin necroses and the neurologic manifestations.

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## SOME EPIDEMIOLOGIC AND PUBLIC HEALTH ASPECTS OF TYPHUS AND ROCKY MOUNTAIN SPOTTED FEVERS\*

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NEW ORLEANS

Since most of the members of this section will be concerned with medical problems as they exist in Louisiana. I will devote the time available to a discussion of the epidemiology and public health aspects of those rickettsial diseases which have been reported as occurring within the state. Brief mention will be made of other diseases in this group that have a related interest.

## MURINE TYPHUS

Of the rickettsial infections, murine typhus has been reported in Louisiana more often than any other. This disease has been summarized as being a relatively mild, acute febrile illness of nine to fifteen days duration, characterized by headache and a macular rash. It is a natural infection of rats and mice transmitted sporadically to man by the rat flea, *X. cheopis*. The etiologic agent is *Rickettsia mooseri*.<sup>1</sup> During the period 1939-1948 there was a total of 2004 cases of murine typhus in Louisiana, this being one of the eight states (Alabama,

Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Texas) in which the major portion of typhus occurs in the United States.

As illustrated in chart I a steady increase in the cases of murine typhus reported occurred from 1939 to 1945 at which time 423 cases represented the peak occurrence. Following this period the incidence of this disease declined rather sharply until a low of 53 cases was reported in 1948. During the first four months of 1949 only 5 cases are known to have occurred. This progressive increase and subsequent decline in cases in Louisiana follows very closely the experience of the United States in general. Of the 2004 cases reported during the 1939-48 period, 76 resulted in death giving a case fatality rate of 3.8 per cent. This is somewhat higher than the average for the United States.

CHART I

REPORTED CASES AND DEATHS FROM MURINE TYPHUS IN LOUISIANA

1939-1948

Year	Cases	Deaths	Year	Cases	Deaths
1939	117	2	1944	283	11
1940	118	5	1945	423	14
1941	201	7	1946	287	8
1942	165	7	1947	125	8
1943	232	10	1948	53	4
Total Cases—2004			Total Deaths—76		

The distribution of murine typhus during 1939-48 has apparently been greatest in the southern portion of the state. Six parishes within the state did not report any cases. The greatest number of infections were concentrated in the following parishes: Orleans (596), Iberia (104), Calcasieu (118), Caddo (95), Washington (109), Avoyelles (72), Lafourche (64). During 1945 the peak incidence year, Orleans Parish reported 118 cases. The next largest number was reported from Iberia Parish (43), Caddo (38 cases), Calcasieu (26 cases), Washington (23 cases), Lafourche (18 cases), East Carroll (17 cases), Avoyelles (13 cases), Vermillion (11 cases). Except for Caddo and East Carroll parishes, the concentration of cases seemed to be greatest in the lower third of the state and here the predominance was apparently as-

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sociated with areas where the density of population was greatest or where environmental factors best favored a comparatively large rat population. Reports obtained from the Public Health Entomologist of the State Department of Health,<sup>2</sup> indicate that the rat flea, *X. cheopis*, which is the principal vector transmitting typhus from the rat reservoir to humans, is available over the entire state, but is found in greatest concentration in the lower portion. This finding is of interest in connection with the occurrence of the major number of human infections in the same area.

A study conducted by C. R. Eskey and F. M. Hemphill of the U. S. Public Health Service, Communicable Disease Center, Atlanta, Ga.<sup>3</sup> has yielded some interesting information concerning the occurrence of typhus in relation to the latitude and the related average temperature of the area involved. The accompanying table taken from their report shows that their studies in Louisiana during the six year period 1939-1944 reveal the annual average incidence of typhus to decrease progressively as the degree of north latitude increases.

CHART II

RELATION OF LATITUDE AND THE AVERAGE ANNUAL INCIDENCE OF MURINE TYPHUS PER 100,000 POPULATION IN LOUISIANA FOR THE PERIOD 1939-44

Degree North Latitude	Annual Incidence of typhus
33-32	3.2
32-31	5.1
31-30	8.3
30-29	9.2

(Extracted from article by Eskey and Hemphill, Public Health Reports, Vol. 63, No. 29, p. 941, July 1948)

On the basis of general information available, murine typhus has its peak incidence in the summer and early fall, usually during the months of July, August, and September. This infection is essentially a disease of the common rat which serves as the reservoir. Infection is transmitted from rat to rat by means of the rat flea, principally *X. cheopis* in this area. Also of importance in transmission of typhus from rat to rat is the rat louse. This latter vector is not of importance in transmitting the disease to man.

Human infection with murine typhus is usually considered to be an accidental transmission of the disease from rat to man by way of the rat flea. The flea becomes infected by feeding on the rat during an acute phase of the disease. When the flea population among rats becomes rather large many of the fleas desert the rat host and attack man. At the time of feeding the flea usually defecates and it is the infectious excreta that provides the transmission of rickettsia to the human host. There is no evidence that human infection has resulted from the bite of the flea. The irritation that follows the flea bite usually causes scratching resulting in the infectious excreta being rubbed into the abraded skin.

The influence of climate on the incidence of typhus mentioned previously is probably associated with a change in activity that occurs in the rat flea as a result of temperature variation. There is also the possibility that opportunity for exposure to infected fleas may have some relationship to the types of clothing worn at various periods of the year and also to the activity on the part of the human that brings him in closer contact with infectious areas.

An infection with murine typhus usually confers immunity to the individual which may last for many years. This infection also produces a certain degree of immunity against the epidemic type of typhus infection. Re-infection in the same individual may occur but this is not the rule.

The hazard from murine typhus has been associated with occupation and place of residence. It has been observed more often in persons employed around grain and feed mills and in food handlers who work in establishments that favor rat harborage or provide a feeding area for the rat population. Persons living in close proximity to garbage dumps or in rat infested dwellings are subject to increased hazard. Transmission of the disease from one human to another has not been observed. In most surveys a predominance of infected rats has been observed in the business districts of urban areas; however, studies in some por-

tions of the typhus area of the country indicate that there is sufficient infection of the rural rat population to make control measures of intensive nature justified in these areas.<sup>4</sup>

Infection with murine typhus has been shown to involve adult groups more often than young children. This is probably associated with the concentration of infected rats and their accompanying ecto parasites to the commercial areas of most cities where large numbers of children are not usually found. Opportunity for exposure is apparently the important factor.

Measures for the control of murine typhus should be directed against the reservoir of the disease, the rat, and the transmitting vector, the rat flea. The principal points in this program involve:

1. The elimination of garbage dumps and the correction of improper methods of garbage collection and disposal.

2. Elimination of rat harborage by rat proofing all new buildings and repairing old constructions in the proper manner.

3. Destruction of the rat reservoir by means of poisoning, trapping, or other effective means.

4. Control of the rat flea by the application of DDT dust to runways and harborages as a preliminary measure to trapping or poisoning. Where the elimination of the rat population cannot be accomplished completely the continued application of DDT dust (5-10 per cent dust) will produce a significant reduction in the flea population and will aid in controlling human infection.

5. A satisfactory vaccine against murine typhus has been prepared by the chick embryo method (Cox type vaccine). Use of the vaccine on a generalized basis is not recommended under ordinary conditions. Chief emphasis should be placed on control measures related to sanitation as mentioned above. The vaccine may be used to good advantage when an epidemic outbreak of typhus is anticipated, or as a routine measure for persons whose occupation requires them to be in close contact with the rat flea.

It should be borne in mind that the vaccine against murine typhus does not confer immunity against the epidemic typhus infection and vice versa.

#### EPIDEMIC TYPHUS

Epidemic typhus is a much more serious and severe infection than the murine form of the disease. The causative agent of this disease is designated as *Rickettsia prowazeki*. Man is the reservoir, and transmission occurs from person to person by means of the body louse. Evidence has also been presented that the inhalation of dried feces from infected lice may be a means in transmitting this infection.

Epidemic typhus usually occurs in connection with conditions associated with human misery, conditions created by war, famine, and other disastrous circumstances that produce crowded living conditions and improper personal hygiene. Major incidence is usually during the winter or early spring. The mortality rate may vary from 10 to 40 per cent. It is comparatively milder in children under age 15.

Control measures against epidemic typhus are directed principally to the elimination of the body louse. Use of DDT powder on the body and clothing have proved to be very effective. One adequate application of DDT will give protection against lice for several days, often as long as two weeks.

An effective vaccine against epidemic typhus has been developed. The "Cox type" vaccine prepared by chick embryo methods has been given widespread use. This material is a valuable adjunct in immunizing persons likely to be involved with epidemic typhus outbreaks. It was especially important in connection with protection of military personnel.

Epidemic typhus has not been a serious problem in the United States.

#### ROCKY MOUNTAIN SPOTTED FEVER

Rocky Mountain spotted fever is a rickettsial infection that will probably have an increasing interest for physicians in Louisiana. The etiologic agent for this disease is designated as *Rickettsia rickettsii* (*Derma-centroxinus rickettsii*). This disease was made reportable in Louisiana in 1943.



Information obtained from the Louisiana State Department of Health indicates a total of 17 cases recorded during the period 1942-48.

ROCKY MOUNTAIN SPOTTED FEVER REPORTED IN LA. 1942-1948	
Year	Cases
1942	1
1943	2
1944	2
1945	1
1946	4
1947	3
1948	4

Parishes involved were: Caddo (3 cases), Webster (2 cases), Union (1 case), Winn (2 cases), La Salle, (1 case), Vernon (2 cases), Rapides (1 case), Ascension (1 case) and Tangipahoa (4 cases).

Originally this infection was considered to be restricted to the northwestern part of the United States in the region of the Bitter Root Valley of Montana. It has subsequently been reported in 41 states.

Several species of tick are capable of transmitting Rocky Mountain spotted fever, the principal variety being *Dermacentor andersonii* (wood tick) in the western part of the United States; *Dermacentor variabilis* (American dog tick) in the eastern United States; and in the southern areas the varieties known as *Amblyomma americanum* (lone star tick) and sometimes the brown dog tick, *Rhipicephalus sanguineus*.

Surveys by the Public Health Entomologist of Louisiana show *Amblyomma americanum* to be abundant over the state. *D. variabilis* is found more often in the northern portion of Louisiana and *Rhipicephalus sanguineus* is fairly prevalent during the early season of the year.

The tick is able to transmit the rickettsial infection to its progeny and thus serves as a reservoir of Rocky Mountain spotted fever. A large number of animals, both large and small, serve as hosts for *D. Andersonii*, furnishing a blood meal for the survival of the larvae, nymphs, or adults. The adult tick bites man readily.

Rocky Mountain spotted fever occurs chiefly during April and May in the west-

ern United States, this being the period of principal activity of the tick vector. In the eastern United States and southern areas the season may extend over a longer period of time.

Attempts to control the vectors of spotted fever have not proved very successful. Personal hygiene, protective clothing, avoidance of danger areas during the tick season and careful search for ticks to remove them before biting takes place have proved to be more efficacious.

Effective immunity against Rocky Mountain spotted fever may be obtained from vaccines that have been developed. The vaccines should be administered in spring or early summer before the tick season begins. This protection is particularly valuable to persons whose occupation, or sport habits take them into areas where infected ticks are likely to be found.

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#### DISCUSSION

Dr. B. E. Nelken: I wonder if the pathologists or bacteriologists could tell me why Q. fever which doesn't agglutinate the *Proteus* group and causes no rash, was placed in the Rickettsial group?

Dr. Buddingh: For the simple reason that the Rickettsiae are recoverable from that disease, and they have all the diagnostic characteristics of rickettsiae. The primary pathological reaction is just like you would see in the rickettsial disease, but the organism is definitely that of rickettsial disease.

Dr. G. Carrera: As regards Q. fever, I would like to pass a bit of information which might be interesting or important to pathologists. A few weeks ago, Dr. Dyer, the director of the National Institutes of Health, told us in a lecture at Tulane, that he knew of a patient who died eight or nine years after having had Q. fever, and the organism was recovered from the heart, liver, spleen, and lungs, at autopsy.

# WINTER ASTHMA\*

HENRY D. OGDEN, M. D.†

NEW ORLEANS

Respiratory allergy due to pollen is mainly of the hay fever type, and is strictly seasonal in occurrence. Bronchial asthma not infrequently occurs as a complication; especially in patients who have a more acute or extreme degree of sensitization. Some pollens appear during the winter months, such as cedar which pollinates in January and February in New Orleans. A thorough knowledge of the anther periods of the important anemophilous pollen is therefore essential in the proper handling of winter asthma.

In contrast to pollen, the perennial type of patient is considered to be sensitive to bacteria or to some ubiquitous inhalant antigen or antigens which are present throughout the year. Some of these cases will have clinical symptoms only during the cooler months. Again in contrast to those allergic to pollen, this group of patients has a much higher incidence of bronchial asthma. In many cases, symptoms of chronic nasal allergy are present for several years prior to the onset of bronchial asthma.

As stated above, there are many patients who have asthma only during the winter months, or who have an exacerbation of symptoms during this time. The three most important factors responsible for this seasonal variation in the opinion of the author are as follows:

1. Meteorologic conditions
2. Increased concentration of inhalant antigens
3. Infection and bacterial sensitization

## METEOROLOGIC CONDITIONS

Climatic or meteorologic conditions have long been recognized as aggravating factors in asthma. There is, for instance, the asthmatic who develops symptoms only

during the periods of weather change. Considerable investigative work has been done on the problem of weather and its effects on the organism as a whole, and it is obvious that climatic changes influence both mental and physical states. It has been shown by microscopic observation of capillaries that the vascular system undergoes abnormally exaggerated reactions, such as spasms or paralysis following thunderstorms or sudden changes in weather. Petersen<sup>1</sup> has shown that vasoconstriction is evidenced by blood pressure changes during the movement of polar air masses.

It has been claimed that coronary thrombosis is more apt to occur during periods of weather change. Weather changes have been stated to affect the autonomic nervous system, the endocrine mechanism, chemical balance (blood pH, K/Ca ratio, and protein concentration), and to even cause variations in the tolerance of various drugs. The allergic individual, who is so characteristically affected by various nonspecific influences, is bound to reflect any such profound changes.

The important factors involved in weather changes are barometric pressure, humidity, and temperature. Courtright and Courtright<sup>2</sup> showed that anaphylaxis in the experimental animal was easier to produce during periods of low barometric pressure. It has also been stated that skin reactions to testing (the antigen antibody reaction in miniature) is increased during periods of low pressure. However, flareup of clinical symptoms does not necessarily follow changes in barometric pressure.

The factor of increased humidity is clinically important. Many patients state that a high relative humidity is conducive to the development of asthma. Many of my patients have stated that asthma will develop when they are exposed to fog or increased moisture in air. However, some asthmatics do not seem to be influenced particularly by the humidity factor.

It is also obvious that in many individuals attacks are precipitated by temperature variations, mainly from warm to cool, and especially at the time of change of sea-

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\*Presented at meeting of the Orleans Parish Medical Society, December 8, 1947.



sons. Many asthmatics whose sensitization is due to an environmental inhalant antigen will have flareups in the fall and spring. In some individuals symptoms are only present at this time. An antigen which is present in relatively small amounts may be generally tolerated by the patient, except during such periods of temperature fluctuations. In the majority of instances the fall exacerbation continues throughout the winter season, although usually of lesser degree.

Cyclonic circulation (alternating tropical and polar air masses) requires constant adjustment on the part of the individual. During the period of falling temperature (the polar air mass) sympathicotonia is present. Petersen and Vaughan<sup>3</sup> state that relative anoxia occurs in various areas of the body which results in smooth muscle spasm. Stimulation of local glands occurs with increased production of mucus, which then obstructs the passage of air through the respiratory tract. Excessive production of mucus is a major cause of obstruction in chronic perennial asthma, and it is in these cases particularly that we see these marked episodes associated with weather changes.

Hilding<sup>4</sup> has shown that in asthma goblet or goblet-like cells may be substituted for the normal columnar ciliated cells. Therefore, more mucus is secreted, which may be intimately attached to the cells. The elimination of the mucus is further hampered by the loss of cilia.

In 13 of 19 fatal cases reported by Petersen and Vaughan<sup>3</sup>, the attacks occurred during the period of falling temperature, and death occurred in 10 during the later stage of rising temperature. They felt that in 6 cases other types of weather change were significant (change in humidity, air ionization, and wind velocity).

At the present time it seems that we must consider a combination of climatic factors, which affect the patient with an allergic background. The movement of air masses (occasionally with increased wind velocity), with resultant alteration in weather, brings with it a variety of changes. Some of these changes may not as yet be

apparent. They may be magnetic or electrical in nature. It has been claimed by some that  $O_4$  (Aran) may be connected with various physiological changes. At the present time, I consider that temperature change is the most important single cause of allergic flareups.

#### INCREASED CONCENTRATION OF INHALANT ANTIGENS

Another important cause of asthma in the winter months is the increased indoor concentration of inhalant antigens. Sensitization to other substances such as foods, and drugs, may coexist, and satisfactory relief may not be obtained unless these other sensitizations are recognized, and properly handled.

Allergy to house dust is the main cause of winter asthma, but allergists have long recognized that other inhalants may be incriminated to a greater or lesser degree. It is most injudicious to merely treat the winter asthmatic with house dust extract, without giving the patient the benefit of a careful allergy study. The presence of these other uncontrolled sensitizations may prevent adequate therapeutic response. As an example, I have seen a young girl, who has recently developed asthma. She gives positive reactions to house dust extract, but we have determined that her main sensitization is to coffee dust. She is employed by one of our local coffee firms and is exposed to it in her daily work.

There are, of course, many other air borne substances which may at times produce symptoms, to mention only a few: wheat flour, cottonseed, animal danders, and molds. With some of these substances, simple avoidance is sufficient, but in the case of others this is practically impossible. In these individuals hyposensitization with the offending antigen is often indicated. All cases should be given specific instructions concerning those substances to which clinical sensitization can be demonstrated. A positive skin reaction may not be sufficient proof that allergy exists to any suspected material. In other words antibodies in the skin do not prove that the reacting substance is producing symptoms in the

shock organ. The allergist appreciates these problems, and the proper evaluation of each case requires careful study, and a knowledge of possible misleading factors. Therefore, anyone interested in allergy must be able to recognize various exposures and contacts which may be of clinical significance. Also, while sensitizations may be multiple, one may be primary and another secondary, (i.e. of an occasional aggravating nature).

It is perfectly obvious that the indoor concentration of these antigenic substances is increased during the cooler months. It must be remembered that house dust is a decomposition product of various fabrics and substances. In cooler weather, heavier clothes are used, and the windows are closed. Rugs, blankets, and window drapes add to the atmospheric concentration. In the fall, clothes are brought out which have been stored during the warmer months, and may contain a considerable amount of dust. In a survey of 140 patients allergic to house dust, I found that all proven cases showed manifestations in the winter season.

This seasonal change in clothing and household furnishings is more apparent in a subtropical area such as New Orleans. It gives a suddenly added antigenic burden during this time, which imparts a definitely seasonal characteristic to these inhalant sensitizations.

#### INFECTION AND BACTERIAL SENSITIZATION

The third important factor responsible for this seasonal variation is bacterial sensitization, which commonly occurs in respiratory allergy. Since respiratory infections are more common in the winter months, this problem requires careful consideration.

All cases of respiratory allergy may be shown to fall into one of the following groups:

a) Noninfective. This group includes those cases who can be shown to be allergic to pollens, foods, and various inhalant substances. In the older classifications they would be labeled "extrinsic". In this type we usually see immediate whealing or urticarial reactions on skin testing.

b) Infective. Here skin reactions are either completely negative, or of no clinical significance. Acute or chronic infections of the respiratory tract are recognized to be of great importance. Exacerbation of symptoms may occur in a flareup of such an infection. The "intrinsic" variety falls into this group. In the true "intrinsic" type of patient, the symptoms are perennial in nature, and show no seasonal variation. There are on the other hand other "infective" cases whose symptoms flare up in the winter coincidental with the presence of acute respiratory infections.

c) Infective and noninfective. Here we have a combination of (a) and (b). In this group clinical allergy to extraneous antigens may be demonstrated with the superimposed factor of bacterial sensitization. It is becoming more apparent that a very large number of cases of the "noninfective" group will show varying degrees of an "infective" component.

The problem of bacterial allergy has received a great deal of discussion. It is felt that there are two main varieties, the atopic and the tuberculin types. In the first variety immediate whealing reactions may be seen on skin testing, while in the latter delayed skin reactions are characteristic. When infection is a cause of respiratory allergy, the sensitizing organisms may at times be found in the paranasal sinuses. These organisms are predominantly of the Gram positive type. In a series of cultures (mainly obtained from antral irrigations) we found that one or more Gram positive organisms (usually staphylococci) were recovered in 52 of a total of 55. Other Gram positive organisms were found in many of them. Cultures of Gram negative organisms alone were found on only three occasions. Vaccines made from these cultures were used in many patients, often with apparent benefit.

In another study with Evans and Kelly<sup>5</sup> diphtheroids were found in an unusually high percentage. Cultures here were mainly from nasal swabs, and incubation was carried out for seven days in a very rich media.



Therefore, the sulfonamides and antibiotics have a definite place in our armamentarium. The value of penicillin by injection or by inhalation is well known. In a controlled study, using 179 patients, I found that the nasal use of tyrothricin did not lessen the amount of allergic manifestations during the cooler weather. In another controlled study<sup>5</sup> we found that the nasal use of bacitracin possibly decreased the amount of allergic symptoms in some patients.

#### CONCLUSION

Asthmatics are prone to become worse during periods of weather change, especially when the temperature is falling. In addition to the winter months, this is especially noticeable during the change of seasons in the fall and spring. The added burden of increased indoor concentration of inhalant antigens must be considered. Infection of the respiratory tract may aggravate asthma, and this factor is of distinct importance during the winter months.

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## TREATMENT OF CONGENITAL GLAUCOMA WITH BETA RADIATION

### REPORT OF A CASE

GEORGE M. HAIK, M. D.  
LOUIS A. BREFFEILH, M. D.  
AND  
J. E. BOGGESS, M. D.\*

NEW ORLEANS

On October 31, 1946, a 5 year old white male was seen in the Pediatric Clinic of Charity Hospital and referred to the Ophthalmology Department with a diagnosis of glaucoma and cataracts.

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When seen in the clinic the history obtained from the mother was that the child's eyes had seemed larger and whiter than normal since birth. She had noticed that the child could not see well, but the degree of the impediment could not be determined.

Examination revealed a well-nourished, well-developed, white male not appearing ill, but with evidently deficient vision. The child was very curious about objects around and seemed above normal in acuteness and energy. When examining an object it was held close to his eyes and his head was tilted to the left.

External examination of the eyes revealed that they were larger than normal, the cornea seemed particularly large, and the anterior chambers were deep. The cornea of the right eye was diffusely translucent and the left eye contained patchy opacities. The iris of the right eye was only hazily seen and the pupil reacted sluggishly to light and accommodation. The iris and pupil of the left eye were normal.

Funduscopically only a pink reflex was obtained in the right eye. The left fundus was not seen distinctly, though the disc was distinguished and some of the vessels were seen. Tension was obtained with the 10 grain weight only and was 48 for the right eye and 55 for the left eye.

The rest of the physical examination and all laboratory tests were essentially negative.

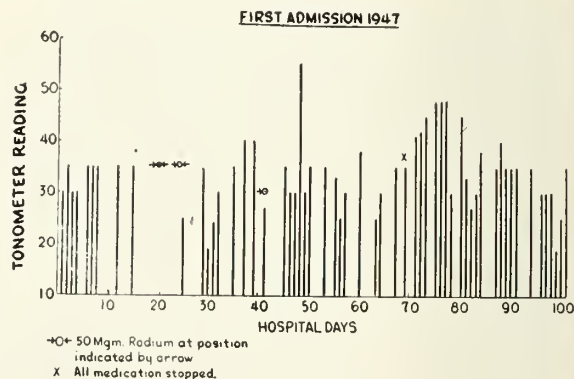


FIGURE 1

The impression of buphthalmos was gained and the child was admitted to the hospital. Pilocarpine, 2 per cent, four times a day to each eye was started. On Novem-

ber 11, an Elliot's trephine was performed on the left eye and on the 18th an identical procedure was carried out on the right eye. Carcholine, 1½ per cent in 1:3000 zepharin, was ordered postoperatively every four hours to both eyes. Within three days the right eye developed marked ciliary injection, lacrimation, and photophobia. The tactile tension in the right eye was elevated but seemed lower than that of the left eye, which was markedly elevated. The cornea of the right eye was hazy. The pupil was about 8 mm. in diameter. A large knuckle of iris and ciliary body was prolapsed into the filtering bleb in the right eye.

On December 2, 5 cc. of sterile milk were given and atropine 2 per cent ordered four times a day to the right eye, along with hot, moist compresses. A moderate rise in temperature was obtained but the eye continued to grow worse so that an enucleation was performed on the right eye and an acrylic resin implant was used. Massages were started on the left eye on December 14. The patient was discharged from the hospital on December 20.

A pathological report on the right eye was as follows:

*Cornea:* An open penetrating wound was present at the left limbus. The opening was partially blocked by organizing connecting tissue and the dislocated lens. The epithelium was irregular and on the right was covered by this connective tissue layer. Bowman's membrane was absent and replaced by wandering connective tissue cells. The anterior chamber was very deep and many pigment-filled macrophages were present on the endothelium and in the trabecular meshwork. An iridectomy was present on the left, with a remnant of a tip of iris adherent to the anterior surface of the lens. On the right the iris showed chronic inflammatory reaction with plasma cells and lymphocytes.

*Limbus:* The left limbar area was involved in the wound but on the right the angle was widely open. Serial section showed the meshwork to be poorly formed and Schlemm's canal to be absent or faulty.

*Ciliary Body:* The ciliary body was prolapsed on the left. On the right there was chronic inflammatory reaction.

*Choroid:* Choroid was detached in the anterior half of the globe by massive hemorrhages. Plasma cells and lymphocytes were present and there was a massive infiltration of eosinophiles. These cells

were present in the inner layer of the sclera but did not involve the emmisaries.

*Retina:* The retina was totally separated by subretinal hemorrhage. There was a disinsertion at the ora on the left.

*Optic Nerve:* The disc showed bowing and glial proliferation.

*Lens:* Dislocated and adherent to the wound on the left. It was covered on the posterior surface by detached vitreous which contained red blood cells and macrophages.

- Diagnosis:*
1. Hydrophthalmos.
  2. Perforating wound, surgical
  3. Dislocated lens.
  4. Detached choroid and retina due to hemorrhages.
  5. Glaucomatous cupping of the disc.
  6. Chronic uveitis.

## SECOND ADMISSION 1948

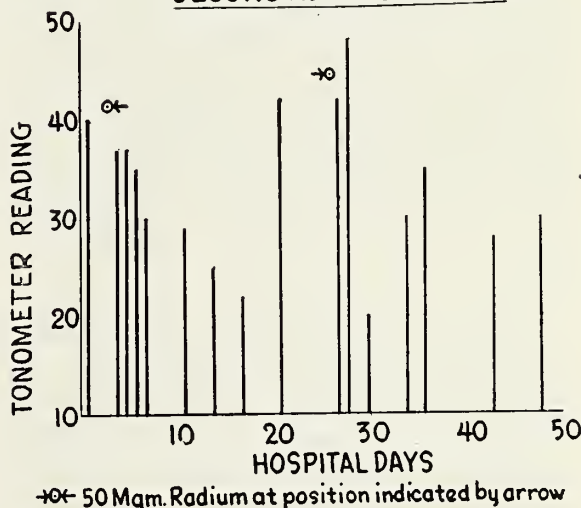


FIGURE 2

On September 13 the patient was seen again for the first time since his discharge, and readmitted to the hospital for further observation. The tension in his left eye was 30 on admission. Prostigmine 2½ per cent and pilocarpine 2 per cent were alternated six times a day until September 22, on which day the dosage was increased to instillation of each of the drugs five minutes six times a day.

This was the only treatment until October 2, when the first application of radium was given. With a 50 mgm. plaque of radium, firm pressure was made on the anesthetized eye over the ciliary body at 9 o'clock for ten minutes. This was then repeated over the ciliary body at 3 o'clock. On October 6 this was repeated. Tensions



were taken practically every day (See Figure 2). Severe hyperemia developed following the last application. This reaction had begun to subside when the third application was given. This consisted of ten minutes over the limbus at 9 o'clock. Following, hyperemia again became severe and persisted for about three weeks. On November 9 there was noticed atrophy of the vessels in areas about 6 mm. in diameter at the points of radium therapy. On November 20, all miotics were stopped in order to observe effects of the radiation. The patient was discharged on December 22, 1947.

The patient was readmitted on January 3, 1948, and on January 5 beta radiation was given for ten minutes over the ciliary body at 3 o'clock. A gonioscopy was attempted on January 26 but the opacity of the cornea prevented visualization of the angle. On January 28, beta radiation was given to the ciliary body at 9 o'clock for twenty minutes. The patient was observed for a bout a month and then allowed to go home.

#### DISCUSSION

Congenital glaucoma is defined by Duke-Elder as a structural abnormality in the region of the angle of the anterior chamber, offering an obstruction to the drainage mechanism for intra-ocular fluids, so that pressure of the eye is raised, and since the coats at this stage are plastic, the while globe becomes enlarged.

Originally all forms of congenital glaucoma were classified as buphthalmos but recently cases have been divided into two groups:

1. Hydropthalmia is the name applied in those cases in which there is either an actual or apparent absence of the canal of Schlemm.

2. Buphthalmia is a condition in which there is an anomaly of the mesoderm at the corneoscleral junction resulting in a persistence of the prenatal condition wherein the trabeculae are not opened up.

Anderson examined and found the canal of Schlemm in 75 per cent of the earliest specimens<sup>2</sup>. He also found no evidence of the canal in one-half of the specimens taken

from children over 2½ years of age, and he feels this absence was due to its closure by the distended eye and its increased intra-ocular pressure.

This patient, upon admission, presented a difficult problem as tension was sufficiently high to cause the enlargement and engorgement described. A gonioscopic examination could not be made at the time and medical treatment was instituted, but it failed to control the tension. Surgery was considered and an Elliott trephine was made on both eyes. Due to thinning of the coats, difficulty was encountered but since the operation could be done satisfactorily it was attempted on the second eye and resulted in the loss of same. An iridotaxis or iridencleisis should have been the surgery of choice and is the one preferred at the present time as it entails less complications.

The histological specimen was diagnosed as hydrophthalmia with an absence of the canal of Schlemm, either actual or apparent, and we may assume a similar condition is present in the other eye. The remaining eye continued to show increased tension and cyclodiathermy was considered but due to the thinness of the sclera and ciliary body and the complications which may result in a one-eyed individual, other measures were searched for and none were considered satisfactory for this individual case.

At the same time the effect of beta radiation on the ciliary body of rabbits was being studied by the Department of Ophthalmology. Although the experiments were not completed, information had been obtained which indicated that the destruction of the ciliary body was sufficient to control the formation of aqueous. It was decided that beta radiation could be used on this case and it was applied over the ciliary body at 9 and 4 o'clock for ten minute periods, using the Iliff applicator which contains 50 milligrams of radium screened by 1/10 mm. of monel metal. A total dosage of fifty minutes at 9 o'clock and thirty minutes at 3 o'clock was used.

The mechanism by which the formation of aqueous was controlled by destruction

of the ciliary body will be found in a full detailed report soon to be published in the American Journal of Ophthalmology by Haik, Breffeilh and Barber under the title "Beta radiation as a possible therapeutic agent in glaucoma; experimental studies and report of a clinical case."

In the treatment of congenital glaucoma Duke-Elder wrote, "The treatment of congenital glaucoma is full of disappointments and frequently quite ineffectual. Some cases, it is true, become arrested, a few respond to treatment but absolute glaucoma and ultimate blindness is the usual end result."

Only those cases of buphthalmia may be offered some hope as goniotomy operation as advised by Burkan has proven successful in 66 cases and unsuccessful in 10 cases.<sup>3</sup>

At present we are not certain of the dosage needed to produce desired results but experiments indicate one hour of radiation in ten minute periods will produce the desired changes. Immediate results are not expected, as it takes time for tissue to react.

Further treatment may be indicated in the case reported here; at present all medication has been discontinued and the tension has remained fairly stable. As to the final results, all indications point to improvement in an otherwise hopeless case.

The latest tonometer readings taken in the clinic on a weekly basis are:

March 2 Schiotz 32 mm.  
March 9 Schiotz 29 mm.  
March 23 Schiotz 13 mm.  
March 30 Schiotz 29 mm.  
April 6 Schiotz 26 mm.  
April 13 Schiotz 32 mm.  
April 27 Schiotz 27 mm.  
May 5 Schiotz 27 mm.

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## ACUTE PULMONARY TUBERCULOSIS

REPORT OF A CASE  
SUCCESSFULLY TREATED BY LOBECTOMY AND  
DIHYDROSTREPTOMYCIN

JACK P. MYERS, M. D.

NEW ORLEANS

There is little in medical literature concerning treatment of caseating pulmonary tuberculosis of the right lower lobe with lobectomy and adjunctive use of dihydrostreptomycin both preoperatively and postoperatively.

It is stated that primary lobectomy is preferable to thoracoplasty when cavities are situated in the basal portion of the lower lobe and the active tuberculous process is limited to the lower or middle lobe.<sup>1</sup> Review of the current literature, however, does not include the simultaneous use of dihydrostreptomycin with this procedure.

The following case is reported because of the striking and dramatically rapid result obtained.

#### CASE REPORT

A 16 year old white male was admitted to Hotel Dieu, New Orleans, Louisiana, on January 19, 1949. For four years the patient had diabetes which was well controlled by 25 units of protamin zinc insulin daily. On January 13, 1949, the patient suddenly developed a high fever (101.6° F.) followed by an acute, severe pulmonary hemorrhage. He was seen by his physician in Picayune, Mississippi, who gave him 300,000 units of penicillin. However, the patient continued to run a febrile course and hemorrhaged twice the following day, each time expectorating about a cupful of bright red blood. He was admitted to The Picayune hospital on January 15, 1949, at which time 75,000 units of penicillin were administered every three hours and 0.5 gram of streptomycin every six hours. He became afebrile on January 17, 1949, but on January 18, 1949, another severe pulmonary hemorrhage occurred. During this time the patient received 80 to 90 units of insulin daily and was on a 1500 calorie diabetic diet. On January 19, 1949, the patient was sent to the Hotel Dieu Hospital. The history revealed that since approximately November 1, 1948, the patient had been coughing. The cough was only occasionally productive of greenish sputum, which was not foul smelling. There was also history of frequent coughs during the past six months which were of brief duration. There had been no weight loss or excessive fatigue. Two weeks before the onset of the present illness, he had an attack of chills and fever which quickly subsided. There was occasional substernal dull



pain after coughing. A persistent frontal headache had been present since the onset of the present illness. The patient was a high school student of normal intelligence who stated that he had been well all of his life except for diabetes mellitus, which was well controlled. A chest x-ray had been taken two years ago and reported negative. He had been knocked unconscious about a month before admission while playing basketball but suffered no harmful after effects. There was no family history of tuberculosis.

**Physical Examination:** The patient was a well developed, 16 year old, white male appearing very pale, apprehensive and acutely ill. On admission his temperature was 99.6°, pulse 70, respiration 20, and blood pressure 95/60. He was six feet one inch tall and weighed 128 pounds (58 kg.). The physical examination was essentially normal except for the chest findings. There was slight diminution in intensity of the breath sounds over the right middle and lower lobes, with dullness on percussion noted over this area. An occasional fine crackling r le was heard over the right lower lobe which persisted after coughing. There appeared to be a slight deficiency in expansion of the lower half of the right chest.

**Laboratory Findings:** The roentgenogram showed a cavity situated posteriorly at about the midlevel of the lower lobe. There was considerable interstitial infiltration surrounding the abscess. Admission laboratory work revealed an RBC of 4,900,000 with 13.2 grams of hemoglobin. The WBC was 9,700 with 2 eosinophiles, 6 stabs, 52 segmenters, 28 lymphocytes and 12 monocytes. The color index was 0.9. Urinalysis was negative except for a trace of sugar. There was no acetone. The NPN was 26 mg. per cent, and the blood sugar was 324 mg. per cent. The sedimentation rate was 30 mm. in an hour. Initial sputum examination revealed no acid fast organisms. It was not until the sixth sputum examination that many acid fast bacilli were demonstrated, but they appeared on all subsequent sputum examinations. At this time the patient was started on penicillin, 50,000 units every three hours, dihydrostreptomycin, 15 grams every 12 hours, and a 1,610 calorie diabetic diet. He was given protamin zinc insulin, 25 units, each morning. His urine was checked before each meal, and regular insulin given accordingly. He was placed in postural drainage before the sputum examination became positive. The blood sugar gradually dropped to normal limits, and the urine became free of sugar. On January 31, 1949, the patient was seen by Dr. George Taquino. Using pontocaine to spray the throat and hypopharynx and 10 per cent cocaine in the pyriform fossae and in the trachea, a bronchoscopy was done. The mucous membrane of the right lower lobe bronchus was extremely thickened and highly inflamed. The rest of the bronchial tree was apparently nor-

mal. Tubercle bacilli were found in the bronchial secretions.

The patient became afebrile and began to feel and look much better. His diabetes was well under control. On February 2, 1949, a surgical consultation was requested, and it was the opinion of the consultant, Dr. F. F. Boyce, that in view of the findings of positive acid fast sputum with cavitation in the right base and the repeated pulmonary hemorrhages earlier, a lobectomy was indicated.

**Surgical Procedure:** The patient received multiple blood transfusions, and his diet was increased to 3000 calories supplemented with vitamins. On February 7, 1949, a right lower lobectomy was done. The right lower lobe was infiltrated with nodules and contained an abscess filled with caseous appearing material which was opened during separation of the lower lobe from the middle lobe. It was noted at the time of operation that there was minimal tubercular involvement of the middle lobe of the right lung. It had appeared from x-ray that only the right lower lobe was involved. The right upper lobe appeared perfectly normal. The patient received blood during the operation. The blood pressure was maintained above 100. The patient left the operating room in good condition.

The pathological report was as follows: Gross description. The specimen consisted of a lower lobe of lung weighing 375 grams measuring 15 by 12.5 by 6 cm. It was nodular and firm. The pleural surface was roughened by old adhesions. On section there was nodular caseating tuberculosis involving the entire lobe. The nodules were confluent to form masses up to 1.3 cm. in diameter. Under the lateral pleural surface was a 4 cm. old thick walled cavity filled with clotted blood, smaller caseous filled cavities were found up to 1.5 cm. in diameter. An opened, partially emptied, 2 cm. cavity was present in the upper portion of the lobe. Semicaseous material was seen in some of the smaller bronchioles. The second order bronchi showed gross ulceration. Microscopic diagnosis: Caseating nodular pulmonary tuberculosis with recent and old cavitation. The intervening pulmonary tissue showed fibrosis.

**Clinical Course:** The patient had an uneventful postoperative course. The temperature rose to 101° F. on the first postoperative day, rapidly returning to normal, and the patient was afebrile from that point on. The patient was in an oxygen tent for one week postoperatively, received blood, glucose, and saline infusions and was continued on penicillin and dihydrostreptomycin as before. His diabetes was well controlled by giving insulin to scale for the first four postoperative days, and then by giving regular insulin, 30 units, and protamin zinc insulin, 15 units, every morning. All sputum examinations, gastric washings, and

urines were negative for acid fast organisms after the operation. The sedimentation rate returned to normal. He was discharged greatly improved on the thirteenth postoperative day. He was sent home, where he received 0.5 gram dihydrostreptomycin twice a day. The patient was seen again on March 21, 1949, at which time a chest x-ray showed some elevation of the right diaphragm and some pleural reaction along the periphery. The right lung appeared well aerated. The left lung remained clear. The patient looked and felt well and had gained five pounds. All the chest findings were completely normal and sputum examinations were negative for acid fast. Dihydrostreptomycin was reduced to 0.5 gram daily at this time.

On April 23, 1949, an x-ray revealed a normal chest. The patient had returned to school, felt excellent and had gained 15 pounds since his discharge from the hospital. Physical examination was completely normal. Dihydrostreptomycin was discontinued at this time. There had been no signs of any toxicity to the dihydrostreptomycin.

#### COMMENT

It is still too early to draw any definite conclusions from this particular case, but the change in this boy's condition within a period of one month was startling. The amazing clinical improvement along with the normal chest x-rays, repeated negative sputum examinations, and the absence of physical findings permits the diagnosis of arrested tuberculosis.

Close observation will continue at least another year. In the meantime, the patient has progressed from an acutely ill individual to a healthy young man who has completely resumed his interest in normal social pursuits. Because of the unusual nature of the tuberculous lesion and the dramatic response to surgery and to dihydrostreptomycin, I feel that this case should prove encouraging in cases of similar nature where a lobectomy combined with dihydrostreptomycin therapy might offer prospect of improvement in spite of the fear of dissemination.

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## BRUCELLOSIS WITH JAUNDICE\*

### REPORT OF A CASE

LOUIS A. MONTE, M. D.

AND

JOHN E. GARCIA, M. D.

NEW ORLEANS

It is now well established that brucella infection in man may masquerade under any of its numerous atypical clinical expressions. Hall<sup>1</sup> mentions the nonspecificity of symptoms and signs and states that dependence on laboratory tests is sometimes wrought with diagnostic confusion. The occurrence of jaundice in brucellosis has been encountered by previous authors. Harris<sup>2</sup> mentions in his textbook a case with jaundice and clay colored stools reported by Green, and states that he has observed moderate jaundice in several patients. Parsons and Poston<sup>3</sup> in a most exhaustive necropsy report describe a mechanical obstruction produced by enlarged lymph nodes at the hilum of the liver, which resulted in great dilatation of the bile canaliculi with tremendous round cell infiltration in all portal areas and considerable fibrosis. This could be explained on the basis of obstruction with perhaps an ascending infection. Gall bladder infection by the brucella organism and the recovery of the organism by duodenal drainage are mentioned by Harris<sup>2</sup> and deserve clinical attention.

A case report of obstructive jaundice due to brucella infection is herein reported. We believe it of interest not only because it explains the pathogenesis of the jaundice, but also because of the masquerading nature of the infection. The presentation will be given in a chronological order as nearly as possible.

#### CASE REPORT

A white male, 45 years of age, was admitted to the Mercy Hospital on December 20, 1947, to be studied regarding the etiology of jaundice of two weeks' duration. The history of his illness began approximately four weeks before admission, with anorexia, belching, and upper right quadrant dis-

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comfort. Two weeks later he noticed that his urine was darker than usual and the stools lighter in color. Shortly thereafter a yellow discoloration of the eyeballs occurred. About this time the patient began to have chills and fever, mainly in the evening, accompanied by rather profuse sweats and marked weakness. The patient was given a course of penicillin and because of its ineffectiveness sulfadiazine was substituted, which likewise failed to abate the symptoms. In the meantime the stool had become clay colored and there was complete loss of appetite.

The patient gave no past history of jaundice or of any other recent illness. The family history was irrelevant. The patient, a fur buyer, resided in Lockport, a town in South Louisiana approximately 40 miles west of New Orleans. The chief means of livelihood in the locale are farming, trapping, and fishing. While the patient knew of no ingestion of contaminated milk, dairy products, or water, the fact remains that brucellosis is endemic in Louisiana and much raw milk is consumed in the rural parts of the state.

Physical examination revealed a well developed and nourished white male adult, with a ruddy complexion and moderate degree of jaundice of sclerae and skin. The blood pressure was 120/85, temperature 101.5° F., and pulse rate 80. The liver edge was palpable about one finger's breadth below the costal margin and was slightly tender. First percussion over the liver posteriorly also elicited some tenderness. The epigastric region was slightly tender and offered slightly increased resistance to the palpating hand. The spleen could not be felt and no superficial glandular adenopathy was detected. The diagnosis of infectious hepatitis was considered tentatively as most likely at this point.

Laboratory data revealed a total white blood count of 6,000, with 49 per cent lymphocytes, 47 per cent neutrophils, and 2 per cent monocytes. The red cell count was 4.8 million with 14.5 grams of hemoglobin. The urine was positive for bile, and urobilinogen was present in a dilution of 1:5. The icterus index was 28, cephalin flocculation 1 plus in forty-eight hours, and the thymol turbidity 1.8 units. The qualitative van den Bergh gave a delayed direct reaction. The one minute serum bilirubin was reported as a trace, with 3 mgm./100 cc. total serum bilirubin. The stool was positive for urobilinogen, but otherwise negative for ova, cysts, and parasites. The blood chemistry was normal and blood Wasserman negative.

The laboratory findings suggested an extra hepatic type of jaundice rather than a hepatocellular type (infectious hepatitis). A short (six hour) G. I. series was done which demonstrated a rather prominent persistent deformity of the first portion of the duodenum, very suggestive of an enlarged gall bladder (Figure 1). Gall bladder vis-

ualization study, after the jaundice had subsided, failed to visualize this organ.

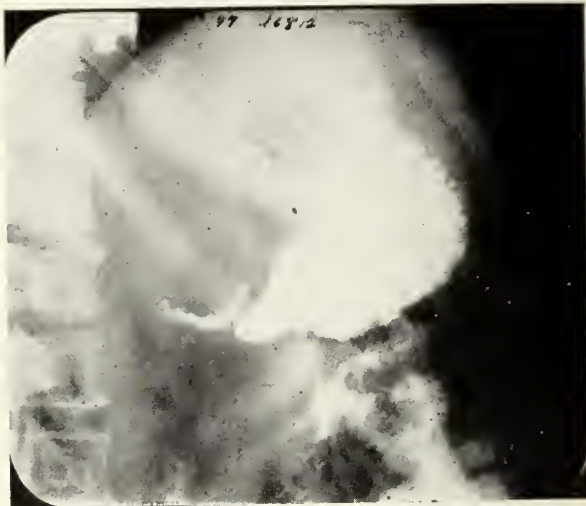


Figure 1. Note the large pressure defect on the superior aspect of the duodenum which is suggestive of gallbladder pressure.

**Clinical Course.** The temperature remained elevated for three days, ranging from 101.5° on the day of admission to 99.5° on the third day, followed by normal temperature thereafter. The jaundice rapidly subsided, and on the eleventh day the icterus index had fallen to 12. With the subsidence of the jaundice, the patient's appetite improved and he became entirely asymptomatic. The urine and stool became normal in color. A repeat six hour G. I. study showed the pressure deformity previously seen to be unchanged. Thus far the patient had received no special medication, but had been placed on a high protein, high carbohydrate, high vitamin diet.

The diagnosis now became that of incomplete obstructive jaundice. The explanation we felt lay between a silent calculus not visualized by x-ray, and biliary tract malignancy. Upon request of the patient, he was allowed to return home on December 31, 1947, in order to attend to some important personal matters, and was instructed to return in two or three weeks.

The patient remained at home the greater part of the following month, during the last week of which he had a low grade fever (99-100°), mild weakness and sweating, and, according to his local physician, a recurrence of mild jaundice. Penicillin was administered until the patient could return to the hospital. When he was readmitted on January 25, 1948 he was afebrile and asymptomatic except for a slight discomfort in the right upper quadrant. Another G. I. series on January 27, 1948, showed the same duodenal deformity (Figure 2.) Laboratory data at this time revealed a white blood count of 7,000 with 54 per cent lymphocytes

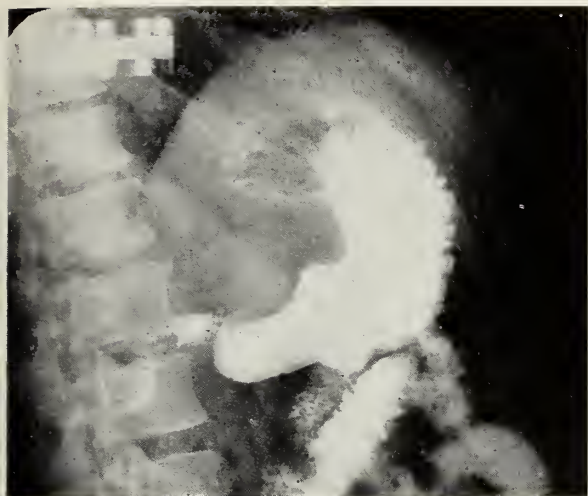


Figure 2. G. I. series, taken 24 hours after attempted gallbladder visualization with double dose of priodax, demonstrates a vague gallbladder shadow immediately adjacent to the still persistent deformity. (Gallbladder failed to visualize on the previous day.)

and 46 per cent neutrophils. The icterus index was 10, and a bromsulfalein test showed no retention of the dye at the end of fifteen minutes. Thymol turbidity was 2.2 units. The urine was negative for bile or urobilinogen.

At this point the findings seemed to us to indicate that we were dealing with a case of incomplete obstructive jaundice. Although there was no evidence of obstruction on readmission to the hospital, the duodenal deformity remained roentgenologically the same. The exact cause of the obstructive phenomena and x-ray findings still eluded us. Consultation with a surgeon was had, and he agreed that exploration was indicated and voiced an opinion that the patient had either biliary tract malignancy or gall bladder disease with silent stones.

On February 2, 1948, the patient was subjected to an exploratory laparotomy. The following, as described by the surgeon, was found: The gall bladder was moderately distended. The cystic duct was of normal size. The wall of the gall bladder was slightly thickened but of normal color and no stones were palpable. The common duct was moderately dilated. The hepatico-duodenal ligament was markedly thickened, mainly in the outer third, caused by enlarged lymph nodes along the posterior and anterior aspects adjacent to and superimposed upon the common bile duct. These extended from the common hepatic duct all the way to the ampulla of Vater posteriorly. Anteriorly the lymphadenopathy extended from the porta-hepatis to the duodenum. Grossly the liver showed evidence of interstitial hepatitis. The left lumbar

gutter and occasional places in the mesentery of the small bowel contained enlarged lymph nodes. The head of the pancreas was soft and revealed no induration. The stomach and duodenum showed no evidence of ulceration, malignancy or thickening. The glands anteriorly and posteriorly along the common bile duct were completely dissected away. Further examination then revealed that there existed no other abnormality of the extra hepatic-pyloric apparatus.

The operative opinion was inconclusive, since grossly the glands did not appear neoplastic and Hodgkin's disease seemed an unlikely possibility. It was concluded from the operative findings that whatever the cause, the obstructive phenomena were due to pressure on the common duct by the enlarged lymph nodes. Hence final diagnosis we hoped would come from the pathologic study of the removed glands.

While there was no preoperative febrile reaction, there occurred postoperatively a sudden elevation of temperature ranging from 103° to 100°, lasting three days and accompanied by profuse sweating. Thereafter the postoperative course was uneventful and the patient was entirely free of symptoms upon discharge on February 13, 1948.

Extremely interesting was the report of the pathologist, and for this reason it is incorporated in its entirety: The biopsied glands showed numerous small circumscribed discrete and conglomerate areas consisting of cells resembling endothelial cells. These were irregularly arranged and showed no definite pattern. The reticulum cells showed moderate hyperplasia, and areas of chronic inflammation and pyknosis were seen. The histological diagnosis was that of a granulomatous lymphadenitis. Upon the basis of his findings the pathologist suggested that serologic test for brucellosis be made. This was done and two successive agglutination tests for brucellosis revealed a positive reaction at a titre of 1:640 for *B. abortus*. Likewise two blood cultures were carried out under "special technic." Both cultures were reported negative. A skin sensitivity test for brucellosis was made subsequent to the two agglutinations and was found 3 plus positive. The failure to carry out cultural studies of the glands, we feel, at least under the circumstances is forgivable.

The patient was last seen on June 11, 1948, at which time he was still asymptomatic. A repeat G. I. series at this time showed a significant decrease in the duodenal deformity (Figure 3), and a repeat agglutination test showed an increased titre of 1:1280. Examination of this date revealed a palpable, nontender liver edge, and at the site of the previous skin test there remained a prominent depressed scar about 0.5 cm. in diameter. Verbal communication with his local physician reveals that the patient remains entirely symptom free ten months after the operation.



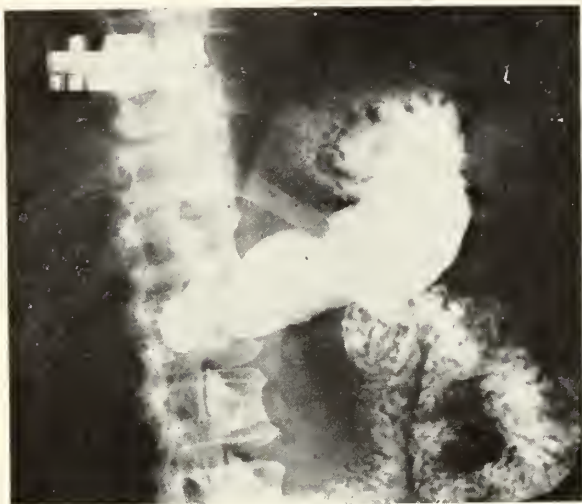


Figure 3. Demonstrates a significant lessening of the deformity five months postoperatively.

#### COMMENT

We readily admit that this case will have to be added to that group of patients with acute brucellosis in whom useless surgery was performed.<sup>4, 5</sup> However, we accept the term "useless" only as it refers to the failure of or need for surgical intervention in favorably altering the course of illness. Though seemingly paradoxical, in retrospect, we think surgery was indicated. Assuming agglutination and skin tests had been included in the study of the patient and the positive results of course obtained, what then would have been done? Much discussion and deliberation would have ensued, since we would have been confronted with both a therapeutic and, in part, a diagnostic problem. Would the diagnosis of acute brucellosis have satisfied the entire clinical expression in this case? Would we have been willing to visualize the pathogenesis as that of lymphatic glandular adenopathy which, by means of pressure encroachment, was causing the obstructive and duodenal deformity? Our answer we feel certain would have been no. If the possibility of a silent biliary calculus had been the only other condition to be considered, postponement of surgery would not only have been justifiable, but indicated. On the other hand there would have remained the possibility of biliary tract malignancy, which has in the past defied our diagnostic

acumen and often still does. It might then have been assumed, on the basis of the agglutination titre, that this patient, who lives in a region where brucellosis is endemic, might have had infection in the past, or, if the increasing titre had been detected, that he might possibly be the victim of two diseases.

While we claim no benefit resulting from surgical removal of the obstructive agent, we feel sure no harm was done, and the doubt of more serious pathology was removed. Finally, we admit that as things actually stood prior to surgery, without its help the diagnosis of brucellosis might have continued to remain unsuspected in this case.

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### THE TREATMENT OF INFLAMMATORY DERMATOSES WITH ORAL BISMUTH\*

(SODIUM BISMUTH TRIGLYCOLLAMATE)†

J. K. HOWLES, M. D.‡

NEW ORLEANS

Bismuth has been one of the principal drugs used in the treatment of syphilis for many years. Although its spirocheticidal index is lower than trivalent arsenic, it was relatively a safer drug. The parenteral route was the usual mode of administration, except for an occasional intravenous injection of certain aqueous bismuth compounds. No satisfactory form of bismuth for inunction has ever been perfected. A safe, therapeutically satisfactory, oral form of bismuth that was well tolerated had not been

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†Tablets furnished by Carroll Dunham Smith Pharmacal Company, New Brunswick, N. J.

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forthcoming until sodium bismuth triglycollamate, known commercially as "Bistri-  
mate," was introduced.

The original clinical investigation with this drug was conducted to determine the value of the oral form of bismuth in the treatment of all stages of syphilis. In the course of the investigation, quite by accident, and at the suggestion of various persons, certain nonspecific, inflammatory dermatoses were included in the scope of the investigative work to determine the response of these dermatoses to bistrimate.

Subsequent reports on the clinical studies of bistrimate have been given by Howles,<sup>1</sup> Gross,<sup>2</sup> and others<sup>3, 4, 5</sup>, in the treatment of various dermatoses. The study on the use of oral sodium bismuth triglycollamate has been continued in the treatment of all stages of syphilis, including cutaneous, visceral, and that of the central nervous system. Bistrimate was used only and in combination with other antisyphilitic measures, but this report is limited to the use of this oral form of bismuth in the treatment of several inflammatory dermatoses.

At first, bistrimate was used only in those dermatoses in which parenteral bismuth had been used and recommended in treating the particular eruption. Because of the low toxicity of this form of bismuth, many inflammatory dermatoses and some noninflammatory types have been added to the list of skin conditions to be included in the study.

The clinical material used in this study was obtained from the Dermatology Clinics of Charity Hospital and from the private practice of the author and his associates.

Sodium bismuth triglycollamate<sup>6</sup> is a bismuthyl salt of triglycollamic acid combined with three equivalents, disodium triglycollamate, to form a double saltlike structure. The molecular weight is 1142 and the bismuth content is 18.3 per cent. Sodium bismuth triglycollamate occurs as a white powder which dissolves readily in water, to give a solution which is approximately neutral in reaction. Solutions of sodium bismuth triglycollamate are stable from a Ph of 2.8, to a Ph of 10.0, and not precipitated

by the ions found normally in the body fluids, such as phosphate and chloride. Each tablet contains 410 mgms. of sodium bismuth triglycollamate, equivalent to 75 mgms. of metallic bismuth.

The pharmacological and chemical studies of bistrimate were carried on by De Graff<sup>10</sup> and associates. The studies on bistrimate have shown that the drug is adequately absorbed from the gastrointestinal tract with relatively little local irritation and is rapidly and completely excreted in the urine. Animal experimentation with analysis of the liver and kidney tissue showed that an accumulation of bismuth, after the oral administration of bistrimate, is no greater than that following the parenteral preparations. The available evidence indicates that any toxic effects produced by the drug are those referable to the systemic action of bismuth. This has proved that the triglycollamic acid form of bismuth is another, and apparently a very satisfactory, means of administering bismuth which has a desirable index of absorption.

Bistrimate, when administered to man in doses equivalent to 300 to 450 mgms. of metal per day, will produce a daily urinary excretion level of bismuth which usually exceeds the 2 and 4 mgm. per day considered necessary by Cole and co-workers,<sup>5</sup> for the useful antisyphilitic agent. It has been shown that under these conditions the drug is well tolerated over a period of continuous therapy, as long as a year.

This report contains only cases of dermatoses not included in the previous report presented by Gross,<sup>2</sup> and the author at the American Medical Association meeting, June 1947.

CHART I  
COMPILATION OF CASES TREATED WITH  
BISTRIMATE

Verruca .....	69
Lupus Erythematosus.....	69
Vitiligo .....	56
Lichen Planus .....	39
Sarcoidosis .....	11
Granuloma Annulare .....	9
Plantar Warts .....	9
Morphea .....	6
Scleroderma .....	5



VERRUCAE

There were 69 cases of verrucae in this group. They included 38 cases of verrucae vulgaris, 9 cases of verruca plana, 12 cases of plantar warts and 10 cases of filiform warts. In the multiple verruca vulgaris cases, 15 disappeared completely with no evidence of recurrence, 12 of the cases showed marked improvement, 4 cases showed slight response, and 7 cases grew worse under the treatment. Of the 9 cases of verruca plana, 4 of the cases responded completely to treatment; 5 of the cases showed slight improvement. In the 12 cases of plantar warts, 2 cases were treated with bistrimate alone and showed slight improvement clinically; they became less painful but the plantar warts did not disappear entirely under this form of therapy alone.

In the remaining 10 cases, bistrimate was used as an adjunct to radium therapy and peeling methods. When checked with control cases, the oral bismuth proved to shorten the duration of the treatment; and the percentage of recurrences was definitely lowered. The treatment of filiform warts was augmented by oral bismuth. In the 10 cases treated by various accepted methods, the use of bistrimate proved an excellent adjunct to these various methods.

LUPUS ERYTHEMATOSUS

Several workers have made contributions on the effect of bistrimate when used in lupus erythematosus. The new oral bismuth preparation seems to be very efficacious in the acute discoid type but to a lesser degree in the subacute discoid and chronic atrophic types of lupus erythematosus. Many of the patients with lupus erythematosus included in this study had been treated previously with parenteral bismuth therapy, without any apparent curative effect, but where oral bistrimate was substituted for parenteral bismuth preparations, the response was in many cases satisfactory and lasting. Most investigators reported uniformly good response in early cases of discoid lupus erythematosus (duration six months or less) but results in the more chronic cases

of discoid lupus erythematosus varied somewhat.

The results we obtained in our series of 69 cases of lupus erythematosus seemed very encouraging.

CHART II  
SUMMARY OF THE CASES OF LUPUS ERYTHEMATOSUS TREATED WITH BISTRIMATE

TYPE	NUMBER OF CASES	CLINICAL RESPONSE		
		GOOD TO EXCELLENT	FAIR IMPROVED	UNIMPROVED POOR
Subacute				
Disseminated	3		1	2
Acute				
Discoid	54	22	18	14
Chronic				
Discoid	12	2	3	7

In none of the cases of the discoid type of lupus erythematosus did the patient become progressively worse under bistrimate therapy. However, in a few cases of subacute disseminated lupus erythematosus the patient seemed to become worse under oral bismuth therapy.

All of the cases included in this series have been given supportive therapy, such as vitamins, tonics, general, hygienic measures, and mild, topical applications. Topical therapy is not curative in lupus erythematosus; therefore, it cannot be considered as playing much much part in the results obtained. None of these cases received any gold injections. In our study the best results obtained in the lupus erythematosus group were in the acute discoid cases; in the subacute cases, the response was encouraging but less effective. In the chronic discoid type the results obtained were not as spectacular. In the chronic discoid variety there was radical scarring present after the lesions disappeared.

Of the three patients with subacute disseminated lupus erythematosus one showed marked improvement, but, as is well known, this disease is a serious one and an acute exacerbation may occur. Two of the three patients have shown no response or have become worse under the bistrimate therapy.

The patients received on the average of four tablets daily. Some received two tab-

lets three times daily, or a total of 450 mgms. of the drug daily and continuously. The average time during which the patients in this group received bistrimate tablets was three and one-half months. Some have required up to five and one-half months; in some of the patients the good response to the drug is still going on and in time may be classified as a clinical cure.

The number of cases of the disseminated type was so small that it would seem unwise to draw any conclusions in appraising the results of the drug in the treatment of such a serious disease and one accompanied with such a high degree of mortality.

#### VITILIGO

For some time we have used bismuth subsalicylate in the treatment of vitiligo, with varying results. The parenteral use of bismuth alone and in combination with gold and sodium thiosulphate injections intravenously has been employed. The response seemed to depend largely on the duration of the pigmentary disturbance and the age of the patient. Bistrimate tablets were substituted for the parenteral bismuth and the response was very gratifying. There were 56 cases included in a group in which bistrimate alone was used as an internal therapeutic measure. Twenty-nine of the 56 patients showed slight to marked improvement, as evidenced by minute deposits or islets of pigment appearing in most of the cases, after six to eight weeks of bistrimate therapy. Complete return of pigment was noted in 9 of the patients, after four to eight months of bistrimate therapy. The pigmentary deposits are continuing to appear in many of the patients in which there was any response shown at all. Since this condition is known to be very recalcitrant to therapy and by many is considered incurable, the seemingly long time required for complete recovery is not objectionable. An observation made in most patients with vitiligo, even in 18 which were classified as showing no response to bistrimate therapy, was the absence of new lesions. Bistrimate seemed to stop the progress of the depigmentary disturbance in nearly all of the patients treated.

In five of the patients treated, return of pigment began to be manifest after two to four weeks of bistrimate therapy. In a general observation the young and middle aged patients showed much better response to bistrimate than did the older individuals, particularly the women patients near or subsequent to menopause. It might then be stated that the younger the patients, the better the response to oral bismuth therapy in the treatment of vitiligo.

The time required in the treatment of most cases of vitiligo to obtain satisfactory results was longer than the time interval needed in treating acute discoid lupus erythematosus. The dosage used was one to two tablets of bistrimate three times daily; most of the patients tolerated the larger dose.

#### LICHEN PLANUS

Heavy metal therapy has long been employed for the treatment of lichen planus. Both bismuth and mercury have been used parenterally and have been accepted as a therapeutic measure of debatable value.

Because of the many advantages of oral bismuth over the parenteral form of bismuth, 39 patients with lichen planus were treated with oral bistrimate. Twenty-eight of these cases were acute, generalized lichen planus. Eighteen of these acute cases showed response within four and one-half months. All of the cases were extensive and generalized and the results were considered very satisfactory. Ten of the patients with acute generalized lichen planus did not respond to oral bismuth therapy. There were 11 cases of hypertrophic lichen planus in this group. Seven of these hypertrophic cases seemed to be unaffected by oral bismuth. All patients were given an ointment containing four to six per cent hydrarg. ammoniatum ointment with 6 per cent salicylic acid incorporated as a keratolytic agent.

A control series of 8 acute lichen planus cases, in which the same topical applications were used but with no heavy metal, showed very slight response, if any at all. Vitamin B complex, a laxative, and in cases where pruritis was intense, a mild sedative, were used in both series. Our results were



definitely better in the acute cases of lichen planus.

#### GRANULOMA ANNULARE

In the small series of 9 cases of granuloma annulare treated with bistrimate, the results were very satisfactory. In 5 of our patients almost entire disappearance of the lesions have occurred with bistrimate therapy in less than eight months' time. In 2 patients included in this series roentgen therapy was used and they responded no quicker than the other 3 who received only bistrimate. To confirm the diagnosis, biopsies were done on 7 of the 9 patients. In the other 2 patients a biopsy was not thought necessary to establish the diagnosis as they were both classical.

One of the patients who showed very rapid response to bistrimate therapy had multiple lesions of both forearms and dorsum of the hands. Five years ago this patient was seen with a few annular lesions of the forearms and was treated with unfiltered x-ray, with very little response. The patient was not seen for five years and at this time the biopsy was repeated, and on her return the eruption was extensive as described. She was put on bistrimate and treated with a small dose of unfiltered x-ray at monthly intervals for six months. In two months' time the lesions receded to a considerable degree and continued to recede until at the end of one year she was entirely clear of the lesions. One cannot help being impressed by the excellent results obtained in the treatment of granuloma annulare, with bistrimate.

#### SARCOIDOSIS

Eleven patients with cutaneous sarcoid infection of the Boeck's type were treated with bistrimate. Three of the cases were generalized in type, showing largely dispersed areas on the skin, as well as on the scalp, and generalized adenopathy with bone changes in the phalanges. Biopsies of skin confirmed the diagnosis in all cases and gland biopsies were also done. The response of these patients to bistrimate as an auxiliary measure to the usual routine therapeutic measures employed in treating this recalcitrant, chronic disease, has been surprisingly good. The response of these 3

extensive cases of sarcoidosis seemed to be quicker than in the few other cases of this disease of a comparable degree of severity seen by the author. No gold therapy was used in this small series. In fact, bistrimate was used as a substitute for gold and sodium thiosulphate. We have used parenteral bismuth in other cases of sarcoidosis alone or in combination with gold therapy, but the results seemed to be better when bistrimate alone was used in place of these other drugs. Five of the patients with sarcoidosis in this series have been under continuous bistrimate therapy for over two years without any untoward effects. No evidence of saturation with bistrimate has been noted in this group.

Eight cases of localized sarcoidosis, all of which were diagnosed microscopically as Boeck's sarcoid, were treated with bistrimate.

The response of most of these localized cases of sarcoidosis was slow, as is all therapy in this disease, but the results were encouraging, considering the recalcitrance of this chronic infection.

It is not too optimistic to assume that we have a definite adjunct to our therapeutic armamentarium for sarcoidosis.

#### SCLERODERMA AND MORPHEA

The interest in scleroderma and morphea began when Gross followed the suggestion of Stokes<sup>7</sup>, that a parenteral bismuth compound be used in a morphea-like case which was being discussed at the meeting of the Philadelphia Dermatological Society.

Only 6 cases of morphea and 5 cases of generalized scleroderma treated with bistrimate, are included in this report. The results were very good in 6 of the patients but all cases showed a distinct degree of softening of the skin. No ulcerative lesions were present in any of these patients.

Gross has collected a large series of scleroderma and morphea cases which he has treated with bistrimate, with excellent results. In our original paper<sup>1</sup> on the study of bistrimate, the most uniformly successful results among the nonspecific inflammatory diseases treated with bistrimate were among the scleroderma and morphea groups. Stryker, Tweedal and O'Con-

ner<sup>8</sup> reported 2 cases of diffuse scleroderma which were symptomatically benefitted by oral bistrimate.

#### REACTIONS

The reactions encountered with bistrimate therapy in our series are very few and of mild nature. These findings are contrary to a few reports in the literature, although they are on a small group of cases.

The chief complaint which we observed and which occurred in many patients was "sore gums". This form of gingivitis is not of a severe type and responded to simple hygienic measures. It was not necessary to discontinue the bistrimate therapy in many cases. Aerating mouth washes and riboflavin controlled all of the conditions.

Many of the cases of chronic dermatoses, requiring a longer period of bistrimate therapy, developed a bismuth line of the gums. It was a bluish gray color but caused no serious complications. It is not the severe type of gingivitis so frequently seen in patients treated with some of the internal mercurial preparations, or with parenteral bismuth.

No renal damage was elicited by frequent urinalysis. No hepatic complications were encountered, though in some of the patients receiving prolonged bistrimate therapy, blood chemistry examinations were made at monthly intervals.

Severe stomatitis occurred in one patient having an acute lupus erythematosus, after taking four bistrimate tablets. She gave no allergic history but did give a history of idiosyncrasy to numerous drugs.

A few patients complained of gastric pains of a vague type which required no permanent cessation of bistrimate therapy. A mild gastric intestinal upset observed frequently was not considered as a contraindication to the oral bismuth therapy. A few cases of stomatitis were seen which warranted discontinuation of the drug, but most of the patients with stomatitis were able to resume bistrimate therapy when the dosage was reduced.

Trigeminal neuralgia<sup>9</sup> and tinnitus are reported as a complication of bistrimate therapy. Only a few cases of trigeminal

neuralgia were noted in our series and they were of a mild type and did not require permanent discontinuation of therapy.

Anorexia was encountered in a small number of patients but was of a temporary nature. In most of the mild reactions, reductions of the dosage for a day or two rectified the complications.

In 1 case treated, by one of my associates, the patient developed an exfoliative dermatitis after a short course of bistrimate therapy. The condition was considered to be due to the oral bismuth. No other severe complications were encountered in the study. Blood counts were done frequently on the patients from my private practice and only occasional transient changes were seen in the blood picture while on bistrimate therapy. A transient leukopenia has been reported. Sawicky attributed it to bistrimate.

Neither diarrhea nor constipation were encountered in more than a normal rate while on bistrimate.

#### SUMMARY

The results of a study of certain nonspecific dermatoses, some of unknown etiology, treated with bistrimate, are reported.

It is a continuation of the study previously reported by Gross<sup>2</sup> and the author<sup>1</sup>, but in this report no cases of syphilis are included. While the investigative work on bistrimate in that disease is continuing, it is thought that bistrimate is of sufficient therapeutic value in treating certain nonsyphilitic dermatoses to warrant a report of its use in these cutaneous diseases. No cases reported in the original paper are included in this survey.

Most of the varieties of dermatoses considered in this report were in the preliminary report heretofore referred to. There are a few dermatoses such as vitiligo, and sarcoidosis that were not included in the original paper.

The encouraging results obtained in the granuloma annulare group were very impressive.

The response of acute discoid lupus erythematosus to bistrimate therapy seems to establish this drug as a definite adjunct to



the list of common therapeutic measures generally used in treating this troublesome skin condition. A few of the dermatoses considered were not of adequate number, nor was the time during which they were treated sufficient to make any deductions of much value.

Perhaps the most impressive features, I might even say surprising observations, occurred in the response of the granuloma annulare, scleroderma, and sarcoidosis cases. The lupus erythematosus group continued to respond in a most favorable manner, particularly in the acute cases.

A small series of a few of nonspecific inflammatory dermatoses have been treated with bistrimate but the number of cases of each disease is not large enough, or the treatment with bistrimate not long enough to include in this report the observations and results from these small groups.

#### CONCLUSION

Bistrimate was found to be of great therapeutic value in treating certain inflammatory dermatoses, and in some dermatoses not accompanied by an inflammatory reaction, when given in dosages of three to six tablets daily, preferably after meals. Each tablet contained the equivalent of 75 mgms. of metallic bismuth.

From all appearances, the drug seems to be an excellent adjunct to our dermatologic armamentarium, particularly when used as an auxiliary or supplementary measure.

The relatively low toxicity of bistrimate, the excellent tolerance to this drug, the ease of administration, the infrequency of even mild complications, and the proved balance of the rate of absorption and excretion, seem to justify its use in the types of dermatoses in this survey.

The uncertain control the physician has of the patient when oral medications are used in preference to intramuscular and intravenous drugs, is well recognized, but if one doubts the integrity of his patient to that extent, then all oral medications are to be relegated to a very dubious level.

The results being obtained in the continuance of bistrimate tablets in the various types of syphilis are most encouraging, par-

ticularly in late cutaneous and asymptomatic syphilis. Since this survey comprises part of the original investigations of this oral form of bismuth, we have naturally included observations on a number of dermatoses that were eventually discarded from our survey as being of too little value. As new dermatoses are added to the group we are encouraged by the response to this form of bismuth in some of the nonspecific conditions, such as granuloma annulare and sarcoidosis.

The author is cognizant of the danger of over enthusiasm which is often found when any new drug or therapeutic measure is introduced. This drug is not presented as a panacea, nor does it approach such a standard, but when sufficient usage has enabled us to permit the pendulum of judicious therapy to obtain its proper orbit, we feel bistrimate is a safe and effective therapeutic aid and a great help to the specialty of dermatology and syphilology, in many of our recalcitrant dermatoses.

Sodium bismuth triglycollamate (bistrimate) by mouth appears to be at least as effective as parenteral bismuth therapy (bismuth subsalicylate) in the treatment of some of the inflammatory dermatoses, as listed in this paper. When we consider the convenience of the oral form of therapy and the comparative safety of the oral route over the parenteral form, then the use of the drug seems justified in dermatoses where bismuth is indicated.

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# NEW ORLEANS Medical and Surgical Journal

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## LET US TAKE STOCK

Sixteen years ago a program of socialistic government and economy was initiated by legislative action. Seven years ago a plan of state medicine was proposed and seriously advocated as part of such a program. Some of the results of these policies are now manifest. Former President Hoover said in effect that we were now traveling the broad highway to statism. Former Secretary of State Byrnes said that we were faced with the gradual emergence of the "welfare state." Foreign Secretary Ernest Bevin of Britain declared recently that "the United States is as much of a welfare state as we are."

In the face of such a situation let us take stock. Our dictionary definition of welfare

work is "organized community or corporate efforts for social betterment of a class or group." Let us see then to what extent we are a welfare state. The British program consists of seven chief components. These are food subsidies, low rent housing (including rent control), unemployment compensation, cheap milk free to school children, pensions and national health service, and certain family allowances.

The American program consists of seven similar projects. These are food subsidies, low rent housing (including rent control), unemployment compensation, free school lunches, pensions, and various health activities and public assistance of many types.

The total cost of the British welfare plan is \$5,515,000,000 or \$51 per capita. The cost of our activities in this field is \$7,724,000,000 or \$110 per capita. This then is conclusive proof that we are a welfare state; that the observations of the eminent statesmen were correct, and that the social planners have insidiously introduced in sixteen years a new type of government.

The people of Britain have been lured into accepting and then demanding this sort of social order. The proof here lies in the fact that it is admitted that whichever party wins the coming general election in England it will not undertake to reduce the welfare expenditures materially. This is considered a political necessity in spite of that fact that their income tax starts at 45 per cent and the recent crises show that the country is in a state of economic stagnation.

When we take stock of our position, therefore, we must realize that we also have been lured into becoming a welfare state; that the social planners advocate further extension in compulsory sickness insurance, and more recently in the atrocious Social Security Bill, HR 6000. This bill if made into law will constitute a great threat to our economic liberty and may become the means of introducing state medicine by the side door. The proposed Social Security bill would cost from \$16,000,000,000 to \$24,000,000,000 annually by 1960. Under such conditions, and with this added to existing budgets, one-third of the national income



would be consumed in taxes. Consequent upon such plans would be freezing out of insurance companies and a gradual drying-up of "risk capital."

In discussing the unwillingness of physicians to be taken over by politicians, we could do well to speak on the vicious trend from the welfare state to the police state. The public should realize that there is a fallacy in one-half of the population carrying the other half until they both drop.

In a different age it was taught that the citizens should support the government, and now we are beset with the idea that the government should support the citizens.

We are told by the national authorities of

the Community Chest that four out of every ten families in the metropolitan areas are served in some manner by the Community Chests—in the most prosperous year of the richest country in the world.

Our situation then is one in which our battle against socialized medicine is only a part of a larger battle against the trend of socialism. It is gratifying in recent months to see this stated frankly in high places, and, in accordance with the old dictum that truth hurts, it is interesting to see socialism disclaimed. Now, more than ever, organized medicine should work with the stable elements of the body politic and defeat the plans of an organized minority.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### 1950 ANNUAL MEETING

The Seventieth Annual Meeting of the State Society will be held in Baton Rouge, April 24-26, 1950. Headquarters for the meeting will be at the Heidelberg Hotel and arrangements have been made for adequate meeting rooms, scientific and technical exhibit space, and accommodations for members and guests in attendance. Dr. U. S. Hargrove is general chairman of the Committee on Arrangements and Dr. Arthur D. Long is serving as co-chairman of this committee. Assisting these doctors will be the following chairmen of various subcommittees: Dr. Lester J. Williams, Advisory; Dr. Henry C. Hatcher, Budget; Dr. J. Webb McGehee, President's Ball; Dr. William O. Vennard, Golf Tournament; Dr. Edward G. Cailleteaux, Hotel Reservations; Dr. Claude S. McConnell, Decorations; Dr. Oswald W. Cosby, Lanterns and Movies; Dr. Clifton T. Morris, Publicity; Dr. Leonard H. Stander, Scientific Exhibits; Dr. Charles H. Mosely, Jr., Commercial Exhibits; Dr. W. Shewen Slaughter, Transportation; Dr. Arthur D. Long, Woman's Auxiliary; Dr. William K. Irwin, Registration; Dr. Thomas Y. Gladney, Communications; Dr. H.

Guy Riche, Jr., Signs; Dr. Joseph J. Noto, Luncheons; Dr. Moss M. Bannerman, Meeting Rooms. It is suggested that members refer to this list of committee chairmen when information or assistance is needed in connection with various phases of the meeting.

Dr. Donovan C. Browne, of New Orleans, has ably served as General Chairman of the scientific program for recent meetings and the president of the State Society, Dr. Edwin H. Lawson has appointed him to again serve in this capacity for the 1950 meeting. In addition, Dr. Lawson has appointed the following members to serve as chairmen of the scientific sections: Dr. Henry D. Ogden, Allergy; Dr. Spears Randall, Bacteriology and Pathology; Dr. Marion E. Kopfler, Dermatology; Dr. L. W. Alexander, Ear, Nose and Throat; Dr. George M. Haik, Eye; Dr. Jack R. Jones, Gynecology; Dr. Sam Hobson, Medicine; Dr. T. A. Watters, Neuropsychiatry; Dr. Eugene H. Countiss, Obstetrics; Dr. Jack E. Strange, Pediatrics; Dr. Owen F. Agee, Public Health; Dr. Howard Mahorner, Surgery; Dr. DeWitt T. Milam, Urology, Dr. L. J. Bristow, Jr., Radiology. Appointments

have not yet been made for the sections on gastro-enterology and orthopedics; however, these will be made within a short time. Dr. Harold M. Horack is in charge of the program for the Louisiana Heart Association session which will be held at the time of the State Society meeting and Dr. D. B. Barber, President of the Louisiana Branch of the American Academy of General Practice, will appoint a member to arrange the program for the section on general practice.

Booths for technical exhibits will be installed in the Capital Room of the hotel and also on the mezzanine floor. The capital room is on the highest floor and adjacent to the meeting room of the House of Delegates and general scientific sessions. Meeting rooms for the specialty groups will be located on the mezzanine floor and the scientific exhibits will probably be located on this floor also.

It can be understood from the above that much has already been done in preparation for this meeting and it is hoped that every member will make every possible effort to be present.

### CANCER COMMITTEE ACTIVITY

Currently each week doctors in the eight districts throughout the state are receiving invitations to visit the Tulane and LSU Cancer Detection Clinics. This is a splendid opportunity for the members of the medical profession to observe the best in clinical examination and to keep abreast

of the cancer problem in the progress of scientific medicine. Responsibility to patients requires that doctors keep informed of the advances in essential phases of diagnosis. The doctor's duty is to achieve a cancer-consciousness which will make him use every means to rule out possibility of cancer. We are confident that all who possibly can will avail themselves of this opportunity to widen their knowledge.

The Tulane clinic is held each Wednesday and Friday afternoon at 12:30. Doctors attending are requested to report to Miss Weber's office on the first floor of the Medical School, 1430 Tulane Avenue.

At 10:30 a. m. each Wednesday there is a surgery conference and at 3:00 p. m. a cancer conference. The latter is held in the Delgado Amphitheater. You are cordially invited to attend these sessions while observing the work in the detection clinic.

The LSU Detection Clinic is held on the eighth floor of the LSU School of Medicine, 1542 Tulane Avenue, each Monday and Wednesday afternoon, beginning at 12:30.

There has been provided in the budget an appropriation which will allow each doctor who accepts this opportunity reimburse-equivalent to the cost of round trip transportation by rail from his home. If reimbursement is desired request should be submitted to Dr. John G. Snelling, Chairman Cancer Committee, Ouachita Bank Building, Monroe.

John G. Snelling, M. D., Chairman,  
Committee on Cancer.

## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

### INDUSTRIAL HEALTH CONGRESS

The Council on Industrial Health will hold its Tenth Annual Congress on Industrial Health at the Roosevelt Hotel in New York City, February 20 and 21, 1950.

### NEWS ITEM

Dr. Lucien A. LeDoux attended the Annual Meeting of Abdominal Surgeons, Gynecologists and Obstetricians recently held in Hot Springs, Virginia.



## GET INTO POLITICS TO BEAT SOCIAL MEDICINE, ARENDS TELLS DOCTORS

No matter what the Washington planners say, the compulsory sickness insurance proposal now before Congress means nationalization of American medicine down to the last bottle of aspirin," Representative L. C. Arends (Representative, Ill.) of Melvin, Illinois, told the Illinois State Medical Society (Sunday, September 11).

Representative Arends, who is the Republican whip of the lower house, was keynote speaker at an all-day conference called by the Society in the LaSalle Hotel to discuss the "big push" the administration is expected to make this winter to put over the compulsory sickness insurance proposals embodied in S. 1679. Representatives of most of the 91 county medical societies in Illinois were present together with spokesmen for many other groups opposing socialized medicine. Percy E. Hopkins, M. D., of Chicago was in charge of the meeting, while Walter Stevenson, M. D., of Quincy, president of the Illinois State Medical Society, acted as chairman.

Representative Arends called on the medical and other professions represented to get into politics actively and aggressively as the only way to dis-infect the national government of the socialist contagion.

"When an American citizen is sick or infirm," Representative Arends told the medical men, "he wants to consult a doctor of medicine, not a doctor of philosophy in the Social Security Board, or a doctor of law in the Federal Security Administration, or yet a doctor of political science, or a doctor of civil administration.

## SIXTH DISTRICT MEDICAL SOCIETY

The spring meeting of the Sixth District Medical Society was held at Pallud's Restaurant, Baton Rouge on Tuesday, April 26, 1949 at 8:00 p. m.

The meeting was called to order by the President, Dr. Guy Riche, Sr., Baton Rouge.

The regular order of business was followed. The following physicians were elected as officers for the incoming year: President—Dr. J. DeLoach Thames, Hammond; Secretary—Dr. Burl B. Lane, Jr., Zachary; Treasurer—Dr. Cecil Lorio, Baton Rouge; Vice-Presidents: Ascension—Dr. D. C. Brumfield, Darrow; East Feliciana—Dr. E. M. Robards, Jackson; East Baton Rouge—Dr. Charles McVea, Baton Rouge; Iberville—Dr. Eugene Holloway, Plaquemine; Livingston—Dr. M. Williams, Denham Springs; Tangipahoa—Dr. M. B. Small, Kentwood; East Feliciana—Dr. Glen Smith, Jackson; St. Tammany—Dr. Carl Young, Covington; Washington—Dr. William S. Harrell, Bogalusa; West Baton Rouge—Dr. George Thomas—Port Allen; West Feliciana—Dr. C. J. Wise, Angola; Pointe Coupee—Dr. F. F. Rougon, New Roads.

Dr. M. D. Hargrove of Shreveport gave an en-

lightening talk entitled "Our Society" in which he discussed the Murray, Wagner, Dingle Bill.

Dr. J. Ralph Phillips of Baton Rouge gave a very interesting talk on "Emergency Treatment of Eye, Ear, Nose and Throat Conditions by the General Practitioner."

An invitation by the Superintendent, Dr. Glenn J. Smith, and Dr. E. M. Robards to hold the next meeting of the Society at the East Louisiana Hospital at Jackson was accepted.

## AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The annual meeting of the Board was held in Chicago, Illinois, May 8-14, 1949, at which time 236 candidates were certified.

New bulletins, incorporating changes made at the recent meeting, are now available for distribution upon application and give details of all new regulations.

The next scheduled examination (Part I), written examination and review of case histories, for all candidates will be held in various cities of the United States and Canada on Friday, February 3, 1950. Application may be made until November 5, 1949. Application forms and bulletins are sent upon request.

## WOMAN'S AUXILIARY TO THE LOUISIANA ACADEMY OF GENERAL PRACTICE

With the records of the second annual convention of the Woman's Auxiliary to the Louisiana Academy of General Practice filed, and in order, preparations are now being made for a third meeting to be held in Alexandria, Sunday and Monday, December 11-12, 1949. The previous date of November 12 conflicted with the Southern Medical Association Convention meeting in Cincinnati to be held at that time, and due to hotel reservations already recorded, it was necessary to change the dates for the Alexandria meeting. There will be a definite schedule of plans sent out to the ladies in due time but mark these dates on your calendar.

It has been decided that the interests of the general practitioner will be served more completely if the Academy holds a scientific assembly in the fall, as the Louisiana State Medical Society holds its meetings in the spring. The meetings should in no way conflict, for it is the aim of the Auxiliary to work for the good of both the State Society and the Academy of General Practice.

The president of the Auxiliary, Mrs. D. B. Barber, has contacted the National Board of Directors of the American Academy of General Practice and requested that a positive and active decision be made at their September meeting in Kansas City, as to whether the Louisiana Auxiliary can lay the ground work in organization of a national auxiliary to the Academy, before the National Assembly meets in St. Louis in February. You may be

assured that our own vice-president of the National Academy, Dr. J. P. Sanders, will do everything within his power to convince his board that now is the time to organize an auxiliary. We shall await their decision and if it is in the affirmative plans will be made at once to carry on the work for organization. Come to the Alexandria assembly and hear all about this from your president, Mrs. Barber. Congratulations have come from every national and state officer on the fine enthusiasm of the Women's Auxiliary to the Louisiana Academy to promote the general practice program over this state. We, in Louisiana should be proud that we organized the first auxiliary of its kind in the nation.

It is the aim of both Academy and Auxiliary members to have it well understood that the "baby auxiliary," as we are referred to, will in no possible way interfere with established groups, nor at any time overstep the bounds of activity in any way but to serve the particular interest of the general practitioner. New Orleans ladies are particularly asked to contact Mrs. Bruno Mancuso at Franklin 8401, to arrange for a pre-convention meeting in October.

Your state president, Dean Barber, will notify her executive officers, and auxiliary members in due time of the activities for the ladies during the Assembly. Plans are being formulated but since no definite program has yet been assembled, each member will be notified, personally by the president. Keep your fingers crossed for the decision at the national board meeting this month, and come to your state scientific meeting in Alexandria with a determined spirit to make this FIRST AUXILIARY a SUCCESSFUL ONE. Other leading spirits in the venture are Mrs. Wiginton, the beloved first president, and Mrs. Feldner, president-elect of the group.

The men have advanced the slogan, "Every member bring a member". The women shall say, "Contact the wife of another member and ask her to go to the December convention." The paths that lie ahead are new and untrodden but with careful planning and cooperation from all we may feel assured of a successful meeting at both Alexandria and St. Louis.

Mazie Adkins Guidry,  
Publicity Chairman.

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## BOOK REVIEWS

*Practical Nurse:* By Dorothy Deming, R. N.. N. Y. Commonwealth Fund, 1947, pp. 370. Price, \$3.00.

This "presents for the first time in book form, a summary of past experiences and current practices in practical nursing, as well as best thinking on how to develop a new and desirable kind of practical nurse to serve as a partner for the registered nurse," and will serve as an excellent guide in organizing a program for practical nurses.

Practical nurses are badly needed to fill the gap in nursing which has resulted from the many opportunities occurring in the field of business and industry for competent women; also the advancement in professional nursing has taken many nurses from the bedside.

Miss Deming has more than adequately covered preparation, supervision, legal control, and distribution of practical nurses. Chapters 13, 14 and 15 will aid greatly in establishing schools of practical nursing, setting up curricula for these schools and supervision of graduates of such schools.

After reviewing this book, one is well convinced that it has fulfilled its urgent and fundamental reason for being, "the conviction that patients need and deserve the best practical nursing care they can get".

ROSE H. LINDAUER, R. N.

*Treatment in General Practice:* By Harry Beckman, M. D., 6th Ed., Philadelphia, W. B. Saunders Co., 1948, pp. 1159. Price, \$11.50.

This is a sixth edition. The reviewer has on past occasions stated that when a book has reached into numerous editions it hardly needs any additional critical comments. Yet one cannot resist the thought that the rapid pace of medical advance makes a new edition dated even as it is coming off the press. The author states that "The revision for this sixth edition . . . has been as completely unsparing as progress itself is ruthless." Several new subjects have been included for the first time.

I. L. ROBBINS, M. D.

*The Technique of Pulmonary Resection:* By Richard H. Overholt and Lazaro Langer, pp. 195. Charles C. Thomas, Springfield, Ill. Price, \$8.00.

The monograph by Overholt and Langer is excellently done. It is well illustrated and describes in minute detail the preparation of patients who are to undergo resections of the lung or portions of it. Considerable attention is given to the use of a face-down position and the use of local anesthesia, both of which Dr. Overholt has popularized. Minute description of the isolation and handling



of the individual hilar structures in the performance of pneumonectomies, lobectomies, and segmental resections are included. A considerable amount of space is given to consideration of surgical anatomy of the intrapulmonary and hilar structures. Illustrations are colored, which facilitates their being understood. The technic of segmental resection, which has been popularized by Overholt is described in detail. Postoperative management and the indications for postresection thoracoplasty are also given. The monograph is a real contribution and should be in the library of every individual who contemplates doing thoracic surgery.

ALTON OCHSNER, M. D.

*Medical Etymology: The History and Derivation of Medical Terms for Students of Medicine, Dentistry and Nursing:* By O. H. Perry Pepper, M. D. Philadelphia, W. B. Saunders Co., 1949, pp. 263. Price, \$3.00.

In this small and inexpensive volume, the difficult problem of medical terminology is presented in a manner so reasonable that new workers in the field of medicine can understand and remember the maze of nomenclature. An explanation of the background of medical terminology is followed by explanations of the use and meaning of common prefixes, suffixes, compounds, and transliterations. We are told how eponyms have become a part of medical language, in the association of proper names with conditions and subjects; and of onomatopoeic words, which by their very sound are descriptive.

In each of the preclinical and clinical subjects, lists of words with derivation are presented in such a manner as to make the term itself descriptive and full of meaning. An alphabetic index of the 4,000 principal medical terms enhances the usefulness of the book as a practical tool.

Not the least attractive feature of the book is an inimitable touch of humor which sugar coats the pill. This volume should be a must for every student of medicine, nursing, and dentistry.

MARY LOUISE MARSHALL

*Geriatric Medicine: The Care of the Aging and the Aged:* Edited by Edward J. Stieglitz, M. D.,

M. S., F. A. C. P. 2nd ed. Philadelphia, W. B. Saunders Co., 1949, pp. 773, illus.

The fact that this book, first written during World War II, is now in a revised second edition bears witness not only to its readability and wealth of information, but also to the increasing importance of geriatrics. The individual past the age of forty is discussed system by system, with well known specialists taking over in their respective fields. Due attention is paid to the foundation and principles of geriatric medicine as a whole. It is an exhaustive study, and may well serve as an excellent reference volume for any and all in the field of medicine.

C. BARRETT KENNEDY, M. D.

*How to Become a Doctor:* By George R. Moon, A. B., M. A. Philadelphia, The Blakiston Co., 1949, pp. 131, illus. Price, \$2.00.

The author states this to be a "complete guide." He discusses in an informed manner the quantitative requirements for admission to medical school. He considers the selection of a school and the many problems of the student, male and female, from the beginning to the end of the collegiate career. Since the author is the "Examiner and Recorder of the University of Illinois Colleges of Medicine, Dentistry and Pharmacy," it follows that out of a long experience with students and their problems he has accumulated a fund of information that should be invaluable to those hankering after a professional career and its successful accomplishment.

I. L. ROBBINS, M. D.

#### PUBLICATIONS RECEIVED

Grune & Stratton, Inc., New York: *Early Carcinoma of the Uterine Cervix*, by Hansjakob Wespi, M. D.

W. B. Saunders Company, Philadelphia: *Clinical Biochemistry*, by Abraham Cantarow, M. D., and Max Trumper, Ph. D. *Fundamentals of Otolaryngology*, by Lawrence R. Boies, M. D. *Operations of General Surgery*, by Thomas G. Orr, M. D., 2nd Edition.

Charles C. Thomas, Springfield, Illinois: *Pollen-Slide Studies*, by Grafton Tyler, M. D., F. A. C. P.

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### THE FALLACIES OF SOCIALISM

ROBERT F. HURLEIGH\*

This is my first visit to your city of New Orleans, though I have been in your state several times in the last ten years. And it may be of some slight and passing interest to know that this conservative midwesterner has much in common with the people of the south, generally, and New Orleans particularly. For one thing, my heritage is the heritage of the south, for I was born in that part of the Free State of Maryland which found its sympathies and its politics closely identified with the gray of Lee in a glorious, albeit unhappy yesteryear. Having been born on the Eastern Shore of Maryland, which an Eastern Shoreman never allows you to mistake for Baltimore or Western Maryland, I found my roots planted deep and well. I have been happy to grow these past ten years under the rain and sun and wind of the midwest. But this was a nourished cutting and not a transplanting of roots! And as far as New Orleans is concerned, why I knew about your city history almost as soon as I did the history of Baltimore . . . for I went to a McDonogh School. Yes, I have enjoyed the thoughtfulness, the foresight of John McDonogh, too! And as so many of you know, John McDonogh endowed but one school in Maryland . . . outside the city of Baltimore. And in Maryland, the McDonogh School

grows in stature and scope with the passing of every year. But twenty-five years ago, when first I entered the school for a most pleasant and tremendously worthwhile four years, the school was small and each of us had lost either our father, or both our parents—for that was as John McDonogh had willed it. And we were boarded at the school and worked on the farm, performing chores during the school semesters, and putting in a good day's work during the summer. This one coincidence may be matched with another, and one that may be appreciated in a small degree by the members of the medical profession. At the time of my entrance into the McDonogh School, the chairman of the board of trustees was Dr. J. M. T. Finney—or Dr. John T. Finney. However you knew him—you knew his reputation. He had by 1924, attained his great prominence in John Hopkins Hospital as an associate of the famed Dr. Halsted and contemporary to Dr. Hugh Young, Dr. William H. Welch, Dr. William Osler, and so many other illustrious names in that hospital's and medicine's hall of fame. Since my father had died in the flu epidemic of the seventeen's and eighteen's, my mother had gone into training as a student nurse in the hospital in Salisbury, Maryland, feeling that she had to be prepared to take care of her sons. After graduation we moved to Baltimore where the possibilities for her nursing career seemed better. Before long she was assigned cases where Dr. Finney met her and learned of her problem and interceded to have me admitted to McDonogh Boarding School, while Dr. Young, with family connections in Vir-

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gina, aided in getting my brother a scholarship at William and Mary. So you see, there is a kindred spirit that I shall keep alive between the McDonogh schools, and will always feel proud of the first association I ever had with the medical profession, and which was tremendously worthwhile. Is it any wonder then—that I now feel so honored that I have chosen to lend my voice to the thinning ranks of the vocal conservative? Is it any wonder that I refuse to take the easy road and coast along downhill with the socialists? The fallacies of socialism are obvious, and yet in this great country of ours too few of its thinkers and builders will stand firm against the tide which even now breaks over us, edging us back, causing moral erosion, and an undertow which pulls at our very fibers. Those who churn the waters in this man-made storm are perpetrating a fraud which has been exposed time after time during the past six thousand years. And yet, in every generation there is a renewed interest in the old theories which begins to capture the imagination of the masses. The self-righteous dogooders begin to shout as though they have found a new Utopia—while the self-conscious sycophants mumble their approval in an attempt to build a high decibel count to impress the unthinking people. Sadly enough, these people are impressed. For they are many and many people are selfish and many people want something for nothing and if you promise, and *seem* to deliver these unthinking people applaud without reckoning the cost. It's the old shell game, but too many remain at the gambler's table.

There's not much choice between socialism and communism, and in fact, up to 1917 the words were used synonymously—just as today we speak of free enterprise and capitalism synonymously. Karl Marx,—the disgruntled and bilious,—Karl Marx used the words socialism and communism interchangeably in his writings one hundred years ago—and the revolutionists who overthrew the forces which overthrew the Czar named their government a Socialist government, even as Hitler named his government a socialist government. The point to be re-

membered is that these were dictatorships—predicated upon the ego of a few, but using old clichés and old platitudes to ensnare the unthinking. One can more readily excuse Karl Marx for his fallacious thinking than we can excuse those who today espouse these same theories which time has proved erroneous. The Communist Manifesto and *Das Kapital* which are the ten commandments and Bible of present day communism, need only be read to inform that the author was laboring under the delusion of a static economy and the belief that working conditions would not be bettered through the machine age which was even then being ushered in by way of the industrial revolution. I do not intend to use the little time I have here in New Orleans to review communism and socialism. Suffice to say that those who oppose socialism are morally and economically right. And that is no play on words. We are right, and if we are right of center in being right, that is fine, too! Let us accept the role of the conservative and emblazon the word on our banners and escutcheon. This discussion may seem to approach a political discussion, but I refuse to accept such a thought as valid unless we admit that most every conversation today is political in varying degrees. Certainly the Glenn Taylor type of Democrat has little in common with the Harry Byrd Democrat. By the same token, the schisms within the Republican party have widened because of this same "socialist-conservative" argument. No matter how the proponents of more governmental control slice it, it comes out the same! The individual is nothing—the strength of the party is the only thing that matters! All means are used to maintain this power, even to liquidating those who were considered a source of strength at one time, but whose differences of opinion become embarrassing. When the central government is given great power, such abortions are easily explained. You need only to look at the record to appreciate these facts. And it is repugnant to me to listen to or to read of some supercilious double-dome attempting to bolster the argument for socialism when history

has recorded the failures of all such forms of governments. Plutarch's account of ancient Sparta is as apt a description of communism as practiced today as though we were to have access to all of Russia for our own report. Let us also appreciate that the Pilgrim Fathers established what could be considered the first commune in America. It started on the Mayflower—and the attempt to carry on and operate Plymouth as a commune continued until they awakened to the stern realities of life. Their theories were good—but they had forgotten that theory and practice do not necessarily follow one after the other. Food and shelter became their prime objective, even as it is yours and my objective today. After half the colony had starved through the first winter's commune, they began to put each person on his own for survival. They learned an important lesson the hard way. After learning, they prospered. Other socialist and communistic settlements were established in the new colonies, but they disappeared as the contrast between the socialist groups and the free enterprisers became too great to be long ignored.

The trouble seems to be that we are all just a little selfish, and when we see that we are not doing too well, we want to know why. We are told certain things about socialism—but the proof is absent. Whenever a communistic community or nation is compared to a nation where there is freedom of enterprise, the contrast is so tremendous as to defy rationalization. That is why the masters of the Kremlin refuse to have a free exchange of news or people. They dare not allow their people to make the contrast. It is much like the tailor who is reluctant to allow you to take the suit to the daylight. You must accept their information and their sales talk as gospel. For years, the sales slogan of the Packard motor car company was—and perhaps it still is—"ask the man who owns one!" And every day we see more and more advertisements offering thirty days free trial. We believe the obvious needs no underlining. We know of no instance where one who has chosen the American way of life has willingly re-

turned to the great planned states. The free enterprise system may seem ruthless to us at times, but to someone who has been under the eyes and heavy hand of the protecting socialist states, our system seems impossibly warm and free. They know—even as we may soon see—that the ruthless tactics necessary to get a socialist state started become increasingly more ruthless in the efforts to conceal the errors and the defects of a scheme that never has been made to work and never will be made to work. Anly the stupid, the selfish, or the fool refuses to accept these facts. The fool accepts the theory that under a socialist government "human equality" and the "brotherhood of man" are recognized. The selfish use these points to create catch phrases and build a following. The stupid simply follow like Mortimer Snerd. All three know that such preachings will be difficult to combat, for we, too, are appreciative of morality. But we also have found that the real nature of man must be recognized. We have learned, they have not—or ignore it.

The planners assume to be acting in the public interest and the welfare of the people. We, they say, must not oppose this, for we are not opposed to the public interest and the welfare of the people, are we? How utterly distasteful you feel to be included among those who have "special interests." And at first the "special interest" groups were few—or so we thought. But many a man who today finds himself attacked as a member of a "special interest" group is half-horrified to recall that only yesterday he was self-righteously pointing a finger at another "special interest" group, and supporting, whether he knew it or not, the cause of the socialists.

Now, this particular "special interest" group which honors me tonight must admit to having a lobby in Washington and must admit to the charge of building a three and a half million dollar fund to fight legislation which it opposes. Yet, in very few instances have the members of the medical profession individually campaigned to keep Mr. Oscar Ewing's program from being



made the law of the land. Are we to suppose that the majority of the members of this profession are *for* socialized medicine? Certainly not! For if that were true, then we have a great number of medical men—thinking people—being led around by the decisions of a few. Our doctors, bless them, are self-conscious about this curious position into which they have been forced.

But each must now make his stand clear. The point to be made in the argument to be presented to the public in these critical days ahead is that the self-interest of the individual citizen is involved. I believe we have pointed out tonight how we may have forgotten that this creeping paralysis was not properly diagnosed soon enough, and that the public generally and the poor people particularly have been living in a fool's paradise of ignorance and promises. It is a simple matter to take a lot and give a little. The tax dollars which will be used to further this collectivist and socialistic plan will greatly affect the incomes of the middle class people and the poor. No one denies that many people not now getting medical attention would be benefitted at first by the services to be rendered. At least, everyone will run for the medical grab bag. These same people, however, may be held personally responsible at times for the lack of medical care. It may seem silly to repeat again that many citizens refuse to avail themselves of present low cost medical care for a number of reasons. Many times because of selfishness. To find people of low income groups filling the taverns and race track apron is simply to observe that the American citizen has heretofore spent his dollar where he wanted to spend it. If the citizen desired to rush his car to the garage mechanic the moment a knock was heard in the motor, that was his business . . . although that same man might tell his wife she's simply getting old when she complained about the stairs. If the situation were reversed would we attempt to legislate to socialize garage mechanics? If we are to legislate that a man be forced to pay taxes in order to be conscientious regarding his own and his family's ailments, we should

say so. We must say to the American citizen in forthright fashion . . . and not in the defensive manner of a "special interest" group—that you, Mr. John Q. Public—are already footing a whopping big tax bill—you, Mr. John Q. Public—shell out to the bureaucracy in Washington between 20 and 30 per cent of your earnings every week. You're not getting "something for nothing" in this old world of ours, John! Just look at the recent report of the president's commission to reorganize the government. Examine that report, John, look it over tomorrow night after you and the Missus put the kids to bed and have the dishes cleaned up. Just remember that almost every department in Washington is sloppily run—and expensively run. And just look at the chap who is running around the country telling the people we should have compulsory health insurance because it is in the public interest and that only "special interests" are against it. Ask Oscar Ewing how many of your tax dollars he spent last year for propaganda—and how much he will spend this year. Ask Oscar Ewing if he is a politician with a burning desire for more power or if he is really concerned about the health of the public. Ask Oscar Ewing if this is his idea. Ask Oscar Ewing how many votes does he figure would be available through the use of John Q. Public's tax dollar to build a bigger bureaucracy to administer the socialized health program he desires!

Oscar Ewing is a man, just one of many in the bureaucracy which has been built with tax dollars. He's open to the very same frustrations and desires as any of us. He seems a little frustrated right about now, for he isn't too sure he's going to be able to peddle his little tax-gathering gimmick to the public. And that means that he won't get that Cabinet post to which he aspires. But he'll continue to spend the money to have the propaganda created to try and peddle his Pestle Politic. Not a thought in the world of trying to save his fellow citizens a dollar or two in tax money. No! Oscar Ewing must fight his own special interests: For power and more power. It is obvious now that too many Americans

ignored what was happening to this country through the recent years. The bureaucracy was building, and bureaucracy is always followed by other forms of socialism in order to increase the taxation to pay for the experiments the planners try to sell the people. The doctors and dentists are assumed to be naturally conservative, but we know of few prominent medical men who cautioned us back in 1933 or 1934 — let alone in recent years. Now, suddenly we are faced with the problem of compulsory health insurance and the fingers of the bureaucrats are around our necks and we don't like it. Those who step in the same boat I've been paddling for years might just as well accept the unpleasant fact at once that your arguments and mine are psychologically handicapped by the very nature of man. For we are selling economic morality which in the long run is for the public good. We are competing with economic immorality which looks good and sounds good and offers a short escape from economic reality. For the government cannot give anything until first it takes. And after it has taken it lops off an awfully big slice of the tax dollar before any real return is made to the citizen. Overcoming the psychological handicaps in selling economic morality and conservative thinking in opposition to social fallacies and government taxing and spending can be compared to the handicaps suffered by the wife in opposition to the mistress. The mistress promises glamour, irresponsibility, and escape from the difficult and dull tasks that are essential to decent life. The wife promises very little which is alluring and her appeal must be self-respect, integrity and social responsibility. But the wife is protected by ethics and law, while our thinking has deteriorated to the point where it is fashionable to be sophisticated and sophisticated to accept vulgarities from the mouth of the chief executive in the presence of ladies and gentlemen of Washington's military and social circles. We have noted how this vulgarity had little effect on the public mind. Thus have we been conditioned. For every one person to find it shameful, there were hun-

dreds to hunch an elbow in a friend's rib and say "that's telling 'em off!" Again, evidence that it is easier to sell immorality than morality once the barriers are down. So it is, as we have said, in selling collectivism or socialization as opposed to individualism. Collectivism, socialization, and its ultimate degenerate offspring, fascism or communism appeals to the sadistic instinct of man to destroy those who have more in equipment, resources or talent, appeals to his venal instinct to want something for nothing, appeals to his cowardly instinct to condone evil-doing through mob action, and as we see so clearly today, appeals to his pagan instinct to deny his moral responsibility to God through his conscience. It is impossible to deny that these instincts are universally present in a human being, and we are proving ourselves to be incredibly asinine not to recognize that these instincts have been appealed to since the beginning of time, and certainly during the last several generations by dictators of the left and right. It is easier to be a demagogue than a logician. So it is easier to sell collectivism in any form than to sell individualism. The selfrighteous thinkers, the ignorant and the charlatan, win a ready audience and an immediate following by eager promises which on the surface seem difficult to challenge. But they must be challenged. Not only challenged, but proved to be exactly what they are: The means to an end by power-mad bureaucrats who would, by the sheer weight of politics, be forced to take the next step to full collectivism or socialism and thence to fascism. Let it be noted well that in every plan which has been presented by the collectivists in this country since they sold the administration on the NRA we have had the evilness of the threat of state force. And yet they hide behind the veil of liberalism. But, in every plan there is a desire to take away a personal liberty. And the individual is soon confused into thinking those who would protect his personal liberties are reactionaries while those who would take away these liberties in exchange for a guaranteed security in a brave new world, would



make him like it with state force. Therefore, in fighting the good fight to keep your profession from being controlled by the collectivists you are in honorable combat. Your weapons are words. Your shield is your common sense. You have waited too long for the attack which you should have known was coming. You have waited in the forlorn hope that by some curious reasoning it would stop short of your profession. You ignored the warnings. Now you know. And now you know that the attack will be heavy for the weapons of the enemy have been sharpened and improved through years of application and the arsenal seems unlimited. Yours is an honorable profession. You have made it so. You have a right to defend it.

## CLINICAL USE OF HEPARIN AND DICUMAROL:

### METHODS AND PRECAUTIONS

E. STERLING NICHOL, M. D.

MIAMI, FLORIDA

#### A. HEPARIN

Jay McLean,<sup>1</sup> working in Howell's laboratory in 1916, discovered an anticoagulant in animal tissues, which Howell<sup>2</sup> later named heparin. Heparin was too toxic for clinical use until purified in crystalline form seventeen years later.<sup>3</sup> It was identified in 1935 by Jorpes<sup>4</sup> as a mucoitin polysulfuric acid, carrying a strong electric charge. It is nature's own anticoagulant, found in the mast cells of Ehrlich, and is now processed chiefly from beef lung tissue. It prevents the clotting of blood by the following mechanisms: (1) It helps to prevent the conversion of prothrombin to thrombin. (2) It forms, with serum albumin, an antithrombin. (3) It prevents the formation of thromboplastin from platelets. Its anticlotting effect is abolished by protamine, as first shown by Chargaff and Olson.<sup>5</sup>

Presented at meeting of the Louisiana State Medical Society, May 6, 1949, as part of a symposium on "The Clinical Use of Anticoagulants." (Published in the October issue of this journal).

#### METHODS

The various methods of giving heparin are outlined in Table I.

Before starting heparin, the clotting time is determined using the Lee-White method modified as described by Loewe,<sup>6</sup> using four clean dry 75 by 10 mm. test tubes. The range of normal clotting by this method is eight to fifteen minutes. The objective is to keep the clotting time above three times the patient's normal (twenty-five to forty-five minutes). If the blood is not well heparinized the coagulation time is determined by failure of the blood to run down the side of the tube during gentle tilting. If the blood is well heparinized, sedimentation of the red cells occurs, and although a plasma fibrin clot may form above, this is disregarded and the moment when the red cell layer ceases to flow when the tube is gently angled is taken as the clotting time. Both physician and technician should study Loewe's meticulous discussion of the care required in performing and interpreting the Lee-White coagulation time (LWCT).

TABLE I.  
HEPARIN METHODS

- I. *Intermittent I.V.*: Using 10 mg. per cc. Preliminary LWCT 50 mg. heparin I.V. LWCT 10-30 Min. and 4 hours later. If no hyper-reaction continue 50 mg. I.V. every 4 hrs. (one night interval of 6 hrs.) LWCT every 24 hrs. Objective: Maintain LWCT 25-45 min. or at least 3 times the patient's normal LWCT.
- II. *Continuous I.V.*: Use only if I.V. fluids required.
- III. 200-300 mg. heparin in retarding media S.C. Use ampule without added vasoconstrictors. Clotting time not always adequately prolonged so LWCT needed every 8 hrs. at first. Effective 24 hours.
- IV. Concentrated solution 100 mg. per cc. I.M.??

Heparin may be given intravenously by intermittent doses of 50 mg. every four hours except for one interval of six hours during the night. Twenty minutes after the initial dose the LWCT is done to detect hyperreactivity or hyporeactivity; usually at this point it will range between forty-five and seventy-five minutes. At the end of the first four hour period, blood is drawn for

another LWCT and through the same needle the second dose is given. If the LWCT has then returned to normal, as is usually the case, the 50 mg. dose is continued, but if the clotting is delayed to twenty-five minutes or more, the interval may be prolonged to five or even six hours. Thereafter, once during each twenty-four hours, the LWCT is done to avoid excessive heparin effect.

If the patient needs intravenous fluids, 100 mg. of heparin may be added to a 1,000 cc. flask of normal saline or glucose solution, and given at the rate of 40 drops per minute. The LWCT should be taken after half the amount is used to determine sensitivity to heparin, and the rate of flow adjusted accordingly. The effect of heparin given slowly in this fashion wears off abruptly, so no more than two hours should intervene between the intravenous fluids—and if it becomes desirable to omit fluids, heparin should be started immediately by other methods.

The use of heparin in retarding media\* is rapidly becoming the method of choice, as the preparations now available are well tolerated. Some long acting preparations are prepared with vasoconstrictors added to further prolong the heparin effect, *but under no circumstances should the ampoule with vasoconstrictors be given any patient with coronary heart disease!* The initial deposit for patients weighing under 150 pounds is 200 mg., and over 150 pounds is 300 mg. At the onset, in arterial occlusions, the patient is "primed" with 50 mg. of regular heparin, intravenously, to avoid the delayed response from the deposit. Every eight hours for the first three to four days the LWCT is checked to avoid underdosage or overdosage. A good rule is to administer 200 mg. whenever the LWCT is found to be less than three times the patient's initial clotting time. After the first few days the interval of testing can be stretched to twelve hours and after seven days to twenty-four hours. By this time the usual pattern of response to a given deposit of heparin has become established so it is per-

missible to check the coagulation time only on alternate days. Loewe and Eiber<sup>7</sup> advocate using a 400 mg. deposit and state the clotting time will then be effectively delayed for forty-eight hours or more. This has seldom been observed unless a preparation containing vasoconstrictors is used, and the smaller dose at more frequent intervals appears to produce less wide swings in the clotting time. Evans and Boller<sup>8</sup> found the average duration of effect forty-one hours after a 300 mg. deposit without vasoconstrictors, and sixty-one hours when a deposit was used, part of which contained vasoconstrictors. Holden<sup>9</sup> found the clotting time after a deposit of 300-400 mg. of heparin (not stated with or without vasoconstrictors) to be eighteen to fifty-five minutes after twenty-four hours and rarely over twenty minutes at twenty-four hours. Martin, Artz and McCleery<sup>10</sup> found 200 mg. without vasoconstrictors to be effective for twenty-four hours. The term "effective" as used in these reports refers to *any* increase in the coagulation time, not to a coagulation response of three times the normal, which is required for ample protection against thrombosis. The dosage used, date, and hour of the clotting time should be charted in a coagulogram (Figure 1). Heparin may be continued in this way a month or longer but I have encountered no cases in which a single deposit was effective for four or five days as described by Loewe<sup>11</sup> and doubt if heparin will lend itself to long-term cases. After a month, if it seems desirable to continue anticoagulants indefinitely, dicumarol is started, and heparin omitted three days later when the dicumarol will have become effective. In the "switch-over" to dicumarol it must be borne in mind that as long as the LWCT is over twenty minutes the prothrombin time may be prolonged due to the effect of the heparin on the plasma clotting, so the prothrombin time is to be relied on only after the LWCT approaches normal. This renders the "switch-over" following heparin in deposits a little more troublesome than after intravenous therapy, wherein the heparin effect is usually dissipated within three to four hours. It must

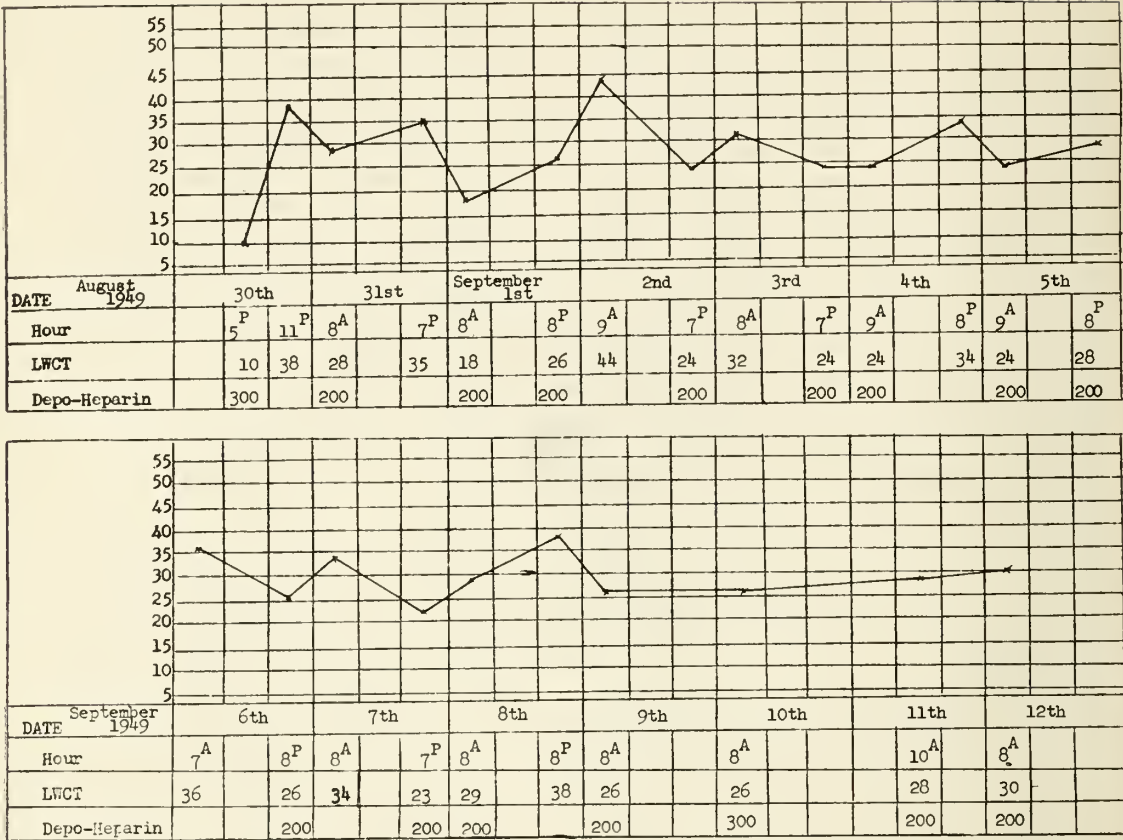
\*Heparin/Pitkin's Menstruum (W. R. Warner Co.) and Depo-Heparin (Upjohn).



FIGURE I.

Mr. N. A.

DEPO-HEPARIN CHART



also be borne in mind that when dicumarol has become markedly effective as evidenced by prothrombin activity below 20 per cent, there may be some prolongation of the clotting time as well but rarely in the first seventy-two hours of dicumarolization. The study by Long, Hurn, and Barker<sup>12</sup> of the effect of heparin on prothrombin time is informative.

Concentrated *aqueous* heparin intramuscularly is said to induce effective hypocoagulability.<sup>13</sup> The use of caronamide in prolonging the effect of heparin Pitkin menstruum has been described by McCleery, Artz and Sirak.<sup>14</sup>

B. DICUMAROL

Everyone knows the debt we owe Karl Link<sup>15</sup> and co-workers for the discovery and synthesis of dicumarol. In spite of further attempts no better oral anticoagulant has been produced and Link<sup>16</sup> is of the belief that since dicumarol was found in nature it is not likely a less toxic substitute will

be synthesized. Although the usual dosage recommended for dicumarol is 300 mgs. the first day and 200 mgs. the second day, it is just as feasible to use 400 mgs. the first day (in divided doses to avoid nausea) and 200 mgs. the second day, and by so doing the height of the dicumarol effect may be reached earlier. In order to avoid overdosage in patients who are sensitive to dicumarol, the dose on the third day should be omitted, and thereafter the daily dose is variable dependent upon the prothrombin time (Table II). The use of divided doses of dicumarol may produce less fluctuation in the prothrombin time,<sup>17</sup> thus if the patient requires 100 mgs. daily, 25 mgs. four time a day, or 25 mgs. morning and night is better than 50 mgs. once daily. In some patients, even long term cases, it is not always easy to adjust the dosage of dicumarol so that a satisfactory prothrombin time bracket is maintained, and this is particularly true for the novitiate. The daily re-

quirement varies from 25 to 150 mgs.; the usual requirement is 75 mgs. It is important that a chart is kept showing in graphic form the daily prothrombin time, preferably both of whole plasma and 12.5 per cent dilution, and dosage of dicumarol. Visualizing the trend on the chart is of great help in following the anticoagulant effect.

TABLE II.

DICUMAROL DOSAGE PLAN BEGINNING 4th DAY	
PROTHROMBIN TIME	DOSAGE DICUMAROL
Over 35 seconds .....	No dicumarol
30-35 seconds .....	25 mg. only
25-30 seconds .....	25 mg. b.i.d.
20-25 seconds .....	25 mg. t.i.d.
Under 20 seconds .....	50 mg. t.i.d.

Above schedule applies only if laboratory uses a thromboplastin which by Quick or Link-Shapiro method gives normal prothrombin time of 11-14 seconds.

Quick's one-stage method of prothrombin determination and the Link-Shapiro modification of this method, are now generally used. Quick's method utilizes rabbit brain thromboplastin\* and the Link-Shapiro modification utilizes rabbit lung thromboplastin\*\*. The Link-Shapiro test calls for determination of the prothrombin time in 12.5 per cent saline dilution of plasma, as well as in whole plasma, which is valuable in detecting thrombotic tendencies and also serves to warn of possible hemorrhage. The results of the prothrombin time determination are expressed in seconds. Anyone who has followed the arguments in the current literature must be aware of the disparity of opinion as to what constitutes adequate laboratory control of dicumarol therapy. For several years it has been argued that in order to accurately gauge dicumarol therapy it is necessary to report the test in terms of percentage of prothrombin activity, which necessitates interpolation of the results on a logarithmic curve constructed from average prothrombin times of serial dilutions of a number of normal plasmas. But errors may enter into the construction of such a hyperbolic curve, and in view of the fact that pathologic plasmas or dicu-

marol treated plasmas cannot be compared precisely with normal plasmas in serial dilutions, regardless of whether normal saline solution or prothrombin free plasma is used as a diluent, the value of transposing the prothrombin time in seconds to percentage of prothrombin activity is greatly vitiated. Furthermore, reduction of the prothrombin activity from 100 per cent to 30 per cent is associated with so few seconds increase in prothrombin time of whole plasma that the difference is practically within the limits of accuracy of the test. Therefore, reports in terms of prothrombin activity by a laboratory using the one-stage method of Quick or the Link-Shapiro modification, have no practical significance unless the the prothrombin activity is below 30 per cent. Shapiro and Weiner<sup>18</sup> state: "It seems to us that to follow adequately the prothrombin response to 'dicumarol', the clinician should know the normal range of the thromboplastin used and the therapeutic range he wishes to establish in terms of time. With this knowledge the calculation of percentage is superfluous; without it the percentage figure is misleading. Of additional importance is the fact that use of figures as percentage of normal may rapidly acquire the connotation of a sense of accuracy which has not been proved. Estimation of prothrombin times is, at best, an indication of the in vitro clotting capacity of a specimen of plasma obtained and studied under certain standardized conditions."

Only time and more studies will incontrovertably settle the question of the proper level of prothrombin deficiency to set one's sights for in dicumarol therapy. I am inclined to agree with Barker and associates<sup>19</sup> who, in December 1947, stated: "When the concentration of prothrombin was kept between 10 and 30 per cent of normal few instances of major bleeding and almost no instances of thrombosis have occurred. This zone of effectiveness and relative safety is a comparatively narrow one and some observers have been satisfied with less drastic reduction in the concentration of prothrombin. This may be sufficient to prevent thrombosis in some patients but is certainly

\*A reliable commercial product is supplied by Difco Company.

\*\*A reliable commercial product is supplied by Maltine Company.



less effective if the stimulus to thrombus formation is strong. *We believe that if dicumarol is used at all, a strong attempt should be made to secure the optimal effect in each patient.*"

A practical rule is to maintain the prothrombin time between two and two and a half times the average normal expressed in seconds obtained by identical technic using the same thromboplastin, in which event the percentage of prothrombin activity will invariably fall between 30 per cent and 10 per cent, a safe yet effective bracket. Several normal plasmas should be tested each day as the commercial thromboplastins vary slightly from batch to batch in potency.

The efficacy of dicumarol in preventing intravascular thrombosis has been questioned because occasionally intravascular thrombosis has occurred in spite of apparently adequate dicumarol dosage. Such instances are often not attributable to failure of dicumarol but rather to failure of the laboratory to render accurate prothrombin tests or to failure of the clinician to anticipate the dicumarol dosage adequately. The disadvantages of both dicumarol and heparin are outlined in Table VI. The delay in obtaining a therapeutic depression of prothrombin activity is obviated by the temporary use of heparin.

Although no set dosage can be established, and each case must be adjusted individually, yet the schedule outlined in Table II can be used as a guide usually, provided the technic and the thromboplastin used gives a prothrombin time of eleven to fourteen seconds in whole plasma of normals.

Since dicumarol is excreted by the kidney any degree of abnormal urea retention was formerly considered a contraindication to the use of dicumarol, but in my opinion only severe renal impairment constitutes a definite contraindication, while in cases showing moderate urea retention the use of smaller doses than commonly used is safe and effective provided extra care is exerted. The ordinary dose may be given in the presence of albuminuria and casts without urea

retention, unless the abnormal urinary findings are due to heart failure, in which case since hepatic congestion is often associated, smaller doses are indicated.

Jubelirer and Glueck<sup>20</sup> recently studied capillary fragility studies in 100 patients receiving dicumarol and found no correlation between the Gothlin index and occurrence of hemorrhage from dicumarol. Dicumarol inhibits intravascular thrombosis, but in glass tubes the coagulation time is not prolonged significantly until the prothrombin activity is less than 10 per cent of normal, and this is not a constant finding. However, in silicone treated tubes the coagulation time for several hours up to forty-eight hours is prolonged when the prothrombin activity is depressed to 20 per cent or less of normal. Moloney<sup>21</sup> and co-workers first showed this, and I have confirmed their observation many times in routine dicumarol treated ambulatory subjects. However, the care required in performing coagulation studies in silicone treated tubes is more bother than performing a one-stage prothrombin time, so the procedure will not replace the prothrombin test and furthermore the duration of hypocoagulable effect from only one hour to twelve or twenty-four hours is subject to such great variability that such coagulation data cannot be used as a guide in therapy. Knisely's<sup>22</sup> recent work on blood sludging in relationship to disease and the clotting mechanism, lead to the observations of Laufman, Martin and Tanturi<sup>23</sup> that heparin and dicumarol do not prevent sludging but prevent the sludged masses of cells in the capillaries from adhering to the endothelial lining of the vessel, thereby preventing thrombus formation in the presence of sludge.

Although a spectro-photometric method for the estimation of dicumarol in plasma or urine has recently been devised by Axelrod, Cooper and Brodie<sup>24</sup> it is not likely that this will replace prothrombin determinations in guiding dicumarol usage, though it should add to our knowledge of the pharmacology of the drug.

HEMORRHAGE FOLLOWING THE USE OF  
ANTICOAGULANTS

One per cent protamine sulfate has been shown to be a clinically effective and safe antidote<sup>25</sup> for heparin. The amount of protamine sulfate used should be calculated approximately milligram for milligram based upon the amount of heparin which it is desired to counteract.

Following the use of dicumarol, bleeding is due to excessive hypoprothrombinemia. Vitamin K either in the form of K-1 oxide<sup>26</sup> or synthetic vitamin K,\* Menadione bisulfite,<sup>27</sup> often reduces the bleeding tendency if given intravenously in adequate dosage. Since gross hematuria will usually clear up on withdrawal of dicumarol within a few days, it may not be wise to use vitamin K intravenously for this complication because of the possibility of increasing the tendency for clots to form within the kidney producing subsequent ureteral colic, a distressing aftermath I have witnessed three times. Transfusion of blood or plasma is of value in brisk hemorrhage whether due to dicumarol or heparin, aiding the restoration of prothrombin deficiency as well as offsetting the heparin effect and in addition replacing the needed blood or plasma volume. The use of ascorbic acid and rutin may serve to avoid hemorrhage.

The incidence of hemorrhage following the use of anticoagulants depends to some extent on the philosophy of the clinician, who may be inclined to "push" the dosage in the belief that it is more desirable to assure patients with cardiovascular disease full protection against thrombo-embolic complications, thus running some risk of hemorrhage, rather than to use a dose carrying with it little chance of hemorrhage that might fail to inhibit intravascular clotting. In using dicumarol, hemorrhage rarely occurs in any event until the prothrombin activity is depressed to 5 per cent unless some pathologic lesion is present in the kidney, liver, gastrointestinal tract, lungs, or brain. Loewe and Eiber<sup>7</sup> said in comparing heparin and dicumarol therapy

in coronary artery thrombosis, "It is comforting to know that injection of larger doses to insure satisfactory heparinization does not invite the hazard of excessive doses of dicumarol. In the patient with an intact cardiovascular apparatus there is little or no risk of hemorrhage, even following excessive amount of heparin sufficient to elevate the coagulation time considerably beyond the requisite level." I cannot fully agree, as concomitant ulceration of any serous membrane caused by any pathological process may lead to hemorrhage when either heparin or dicumarol is used, but admit there is decidedly less purpura and hematuria with heparin than dicumarol, not only because heparin is a natural anticoagulant but probably because the heparin effect wears off more rapidly and the laboratory control is simpler.

Hemorrhage following the use of anticoagulants is usually classed as minor or major, the latter including hemoptysis, gross hematuria, severe ecchymosis or generalized purpura, tarry stools, hematemesis, clinical signs of cerebral or subarachnoid hemorrhage, or any bleeding in the central nervous system, heart, lungs, or abdominal viscera, found at autopsy.

The final report of the American Heart Association Committee<sup>28</sup> will reveal the incidence of minor and major bleeding in 442 "control" cases as 5.9 per cent, and in 589 "treated" cases 9.2 per cent incidence of hemorrhage probably due to anticoagulants, and 6.1 per cent probably due to other causes.

TABLE III.  
INCIDENCE OF MAJOR HEMORRHAGE FOLLOWING  
DICUMAROL REPORTED IN SERIES OF  
CONSIDERABLE SIZE

AUTHOR	YEAR	CASES	MAJOR
			HEMORRHAGE.
Bruzelius	1943	1,645	38
Allen-Barker et al.	1947	2,307	43
Smith-Mulligan	1948	2,353	26
Wise-Loker-Brambel	1949	3,304	79*
		9,609	186 = 1.96%

\*Includes moderate and minor hemorrhage also.

Table III indicates the incidence of major hemorrhage encountered in several large series but does not include all clinical re-

\*The 72 mg. ampule of Abbott's Hykinone yields 60 mg. of menadione bisulfite.



ports. A questionnaire was sent out by the author last fall relative to the incidence of hemorrhage from both heparin and dicumarol and the data obtained will be published.<sup>29</sup> In approximately 15,500 treated cases, most of whom received only dicumarol, the incidence of major hemorrhage reported was 2 per cent. The chief sites were in the urologic tract, operative wound, gastrointestinal tract, rectum, lungs, and skin. The incidence of hemorrhage in my experience has been somewhat higher due in part to my belief in the necessity of insuring full protection against thrombo-embolism. In 160 patients treated for acute myocardial infarction, and in 81 other cardiovascular cases, the incidence of major hemorrhage was 10 per cent. In 54 long-term ambulatory patients given dicumarol for months and years in an attempt to prevent attacks of coronary thrombosis the incidence of hemorrhage was 20 per cent. The details of the hemorrhagic episodes in these cases are discussed in full elsewhere.<sup>29</sup>

Recently Duff and Shull<sup>30</sup> reviewed the literature and reported 23 deaths, including 2 cases of their own, attributable to the use of dicumarol. In addition there have been 5 deaths recorded in the literature following heparin, 4 deaths with dicumarol in my own experience described in detail elsewhere, and 3 similar unreported deaths have come to my attention. Among the 15,500 patients reported upon in the questionnaire, 28 or .18 per cent, died apparently as a result of hemorrhage induced by anticoagulants. Thus a total of 63 cases are now known to have died with hemorrhage following dicumarol or heparin.

TABLE IV.

## HEMORRHAGE WITH DICUMAROL THERAPY

Rarely occurs until prothrombin activity drops to 10% or even 5% unless pathologic lesion present in kidney, gastrointestinal tract, lungs, or brain.

Hemorrhage controlled usually 72 mg. vitamin K, I.V. Repeated in few hours and 6 hours later. Vitamin K-1 oxide more effective.

Transfusions seldom needed except for replacement.

Bruising and mild hematuria less if rutin used?

Lumbar puncture, lumbar procaine block, or thoracentesis may induce hemorrhage.

Table IV is a brief summary relating to dicumarol induced hemorrhage. Certain precautions should be heeded as a result of past experience. One is the danger of performing surgery or even lumbar procaine blocks when an anticoagulant is in effect. Thoracentesis, paracentesis, lumbar puncture, and spinal anesthesia, should be avoided for fear of inducing hemorrhage from the serous membranes. In a case of acute myocardial infarction not clearly diagnosed, the possibility of the presence of dissecting aortic thoracic aneurysm should be ruled out, as this error in diagnosis was followed by death from hemorrhage in 2 instances. Clinicians should acquaint themselves with the laboratory methods of prothrombin determination and Lee-White coagulation time, and should make it their business to see that the laboratory performs the technic meticulously, or else refrain from the use of anticoagulants altogether.

TABLE V.  
ANTICOAGULANT THERAPY  
INDICATIONS*After:*

Vascular surgery.  
Pelvic operations.  
Abdominal operations, especially if history of thrombo-embolism.  
Splenectomy.  
Parturition.

*During:*

Thrombophlebitis or phlebothrombosis.  
Pulmonary embolism or infarction.  
Arterial thrombosis or embolism.  
Acute myocardial infarction.  
Cerebral thrombosis or embolism.  
Mesenteric thrombosis or embolism.  
Retinal thrombosis, arterial or venous.  
Pneumonia, protracted in spite of antibiotics.  
Toxemia of pregnancy.  
Convalescence after hip fractures.

*Long-term:*

Congestive heart failure, even without embolism.  
Thrombo-embolism due to auricular fibrillation.  
After recovery from acute myocardial infarction.  
Selected cases of retinal thrombosis.

Recurrent thrombophlebitis and persistent phlebitis migrans.

#### CONTRAINDICATIONS

Severe liver disease.

Hemorrhagic diathesis.

Subacute bacterial endocarditis.

Recent operations on central nervous system.

Immediately after lumbar procaine blocks or spinal anesthesia.

In advanced renal disease: Use heparin, not dicumarol.

In moderate renal or liver disease: Heparin may be used or dicumarol may be used in small doses.

#### SUMMARY

Table V summarizes the indications and contraindications for anticoagulant therapy, and Table VI summarizes the disadvantages of dicumarol and heparin.

TABLE VI.

#### DISADVANTAGES OF DICUMAROL

No standard dose. Unpredictable response.

Laboratory technic should be supervised by interested clinician unless numerous tests are being run including several normals daily.

Possible effect on blood clotting factors other than prothrombin formation in the liver.

Minimum prothrombin depression necessary to prevent thrombo-embolization varies.

Anticoagulant effect 1st 48 hours inadequate.

#### DISADVANTAGES OF HEPARIN

Intravenous administration irksome or difficult.

Unpredictable effect of heparin/Pitkin menstruum.

Methods of the use of both heparin and dicumarol have been outlined, and the incidence of hemorrhage and deaths from hemorrhage has been emphasized. Once again the strict necessity of meticulous care in the use of anticoagulants has been pointed out.

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#### DISCUSSION

##### (3) *Question:*

In my practice it is not possible to obtain reliable determination of prothrombin time daily on patients who might need dicumarol. Would it be reasonably safe without determination of prothrombin time to give a patient dicumarol for three to four days or longer, provided there was no clinical evidence of liver disease or kidney disease? If this would be reasonably safe, would it probably be effective in the prevention of thrombosis or embolism?

*Answer:* Dr. E. Sterling Nicol:

I am sure if you heard the previous discussion you would know the answer. No doctor has the right to give a patient dicumarol unless he has available a laboratory that can furnish good prothrombin determination. We have seen patients on consultation in different communities that have been given, for example, 50 milligrams a day and were told to take it because that much would be safe, yet hemorrhagic phenomena developed. It is not safe to give any amount; even 25 milligrams a day without laboratory control! You should give an adequate dose as many physicians have undertreated patients and have been disappointed. Please do not ever give any patient dicumarol unless you have prothrombin time run. The first week or ten days you start using dicumarol you need a daily prothrombin time. After a week or ten days, ordinarily you can "stretch" the interval of testing to every other day. By the third week you can ordinarily increase the test interval to every third day. You can save your patient one venepuncture if you want to on the second day as there is not much point in checking the time because there will be no effect from dicumarol that early. Make the test at the start, then wait forty-eight hours.

##### (4) *Question:*

As I understand it, heparin is the only anticoagulant that most general practitioners can use with safety. What would be the best method for a general practitioner to use this agent?

*Answer:* Dr. E. Sterling Nichol:

For the man in general practice, if the patient is in the hospital, it can be given every four hours. It just happens that the hospital where I do work has "intravenous nurses" who work on eight hour shifts and we get good intravenous work done "around the clock". (I would rather use these

nurses than interns, who are not always expert at intravenous therapy.) If the patient is not hospitalized, give heparin in Pitkin menstruum, 200-300 mgs. without vasoconstrictors, and then test the Lee-White clotting time every twelve hours. Keep the clotting time at least three times normal, that is, twenty-five to forty-five minutes, and repeat the dose whenever the clotting time is less than three times normal. The physician can check the clotting time if a laboratory is not available, using the technic employing a cc. of blood in each of four small glass tubes. Do not tilt the first tube until five minutes; the second after another five minutes has past, and the same way with the third tube. Tilting the tube too often alters the clotting time.

As a matter of fact, in our practice my associates and I carry such tubes in our bags and when we see a patient getting heparin we run a clotting time at the bedside. Heparin in deposits with long acting media once a day in the average case will work fairly well, but if the clotting time is under twenty minutes, a second daily injection of 100 mgs. will usually suffice. Dr. Leo Loewe says in his experience deposits of 400 mgs. of heparin last forty-eight hours. Dr. Loewe has used more with vasoconstrictors than I have used in coronary cases and he probably gets satisfactory prolongation of clotting for forty-eight hours. Without vasoconstrictors 300 milligrams is usually effective not more than twenty-four or thirty-six hours. Give it deep subcutaneously, not intramuscularly, laterally in the thigh; not in the buttocks where the patient will lie on it. Do not apply cold to the site of injection unless you want to delay effect of the heparin. Do not apply heat or massage unless you want to speed it up. I think this form of heparin will probably prove to be a satisfactory type of treatment. It is less painful than it used to be, particularly depo-heparin.

##### (8) *Question:*

In extreme old age, such as you run into—eighty-eight and ninety year old patients with fractured hips—is there a contraindication for dicumarol or heparin?

*Answer:* Dr. E. Sterling Nichol:

I do not believe; it is because in some people that age the vascular status is better than mine may be. One paper was published recently cautioning against the use of dicumarol in patients with hypertension. I do have a little feeling that maybe in the older age group, with marked hypertension, we may run more risk of cerebral hemorrhage. We have had 2 cases of cerebral bleeding at autopsy, 1 microscopic, 1 gross, due to rupture of the lenticulo-striate artery. As far as the age factor itself, I do not think that interferes with the use of it. Dr. Irving Wright, Dr. Nelson Barker, and other experts, feel as I do about age not being a limiting factor.

## THYROIDITIS\*

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It is the authors' opinion that both acute and chronic thyroiditis are more common in certain sections of the United States than in others. In the Gulf States goitre is not common as compared to the Great Lakes region. The incidence of chronic thyroiditis in comparison to the relatively small number of goitres is higher than the reported incidence from other sections of this country.

## ACUTE THYROIDITIS

There has been little written concerning acute thyroiditis, and figures relative to the incidence of this condition throughout the country are not obtainable at present. This is due to the fact that these patients do not undergo operation as a rule and no pathological material is available for study.

Within the past ten months the authors have treated 4 patients with acute thyroiditis. All of these cases occurred in married women. The age incidence varied from the youngest of 33 years of age to the oldest of 59 years of age. All 4 complained of a pressure feeling in the neck, tenderness on palpation of the thyroid gland and the presence of swelling in the neck. Weakness and fatigue were prominent symptoms in 2 of the patients and nervousness was a prominent symptom in 2. One of these patients had fever of two weeks' duration and she had obtained some temporary relief with injections of penicillin. Three of the patients had bilateral enlargement of the thyroid and the fourth had enlargement of the right lobe only. None of this group had an elevated basal metabolic rate.

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On examination of an individual with acute thyroiditis the gland is found to be firm on palpation and quite tender. This latter symptom was so marked in one patient she was unable to wear any type of close fitting collar.

The treatment of acute thyroiditis is conservative. Surgery should be avoided. The inflammatory process will clear up promptly as a rule. Lugol's solution and propylthiouracil are of doubtful value. Lugol's solution may be tried and at times seems to be of benefit. In the presence of an elevated basal metabolic rate, propylthiouracil in small doses may be given, but the patient must be observed frequently, as myxedema may ensue. One of our patients in this group was treated with propylthiouracil for a period of four weeks and developed a moderately severe myxedema which responded to thyroid extract. The application of heat or cold to the neck affords symptomatic relief at times.

There is little or no evidence in the literature to indicate that acute thyroiditis is a forerunner of chronic thyroiditis.

## INCIDENCE OF CHRONIC THYROIDITIS

For this study of chronic thyroiditis a series of 172 consecutive thyroidectomies from the Mahorner Surgical Services at the Southern Baptist Hospital and the Touro Infirmary in New Orleans was studied. There was a total of 7 cases of chronic thyroiditis in this series, an incidence of 4.06 per cent. Cases of chronic thyroiditis associated with hyperplastic or adenomatous goitre were not included in this group.

In this series of 7 cases of chronic thyroiditis there were 4 cases of Hashimoto's disease or struma lymphomatosa, an incidence of 2.32 per cent; 2 cases of Riedel's struma, an incidence of 1.16 per cent, and 1 case of chronic nonspecific thyroiditis, an incidence of .58 per cent.

McSwain and Moore,<sup>1</sup> in a review of the literature in 1943, found the incidence of struma lymphomatosa to be less than 1 per cent. Marshall *et al.*,<sup>2</sup> in a series of 25,000 thyroidectomies, found an incidence of .75 per cent of chronic thyroiditis. Boyden



*et al.*,<sup>3</sup> in 1935, reported an incidence of .36 per cent of Riedel's struma in a series of 2500 consecutive thyroidectomies from the University of Michigan. DeCourcy<sup>4</sup> reported an incidence of 2 per cent of Riedel's struma in his study of thyroidectomies in Cincinnati.

A review of the record room statistics of the Touro Infirmary in New Orleans reveals an incidence of 8.0 per cent thyroiditis during the ten year period of 1938 through 1948. A review of the record room statistics of the Southern Baptist Hospital in New Orleans reveals an incidence of 8.6 per cent of thyroiditis during the twenty year period 1926 through 1946. These figures were taken from the record room statistics of the two hospitals and were therefore open to criticism, as no review was made of the individual clinical records.

Therefore, since these percentages seemed unusually high, a study of all the thyroid specimens removed surgically at the Southern Baptist Hospital during the period January 1, 1945, to April 1, 1949, was undertaken. The total number of surgical thyroid specimens was 222. The slides in all cases diagnosed as chronic thyroiditis during this period were reviewed and only those cases retained that could be classified as a primary disease. The number of cases thus diagnosed as chronic thyroiditis was 18 out of the total of 222 thyroidectomies, or 8.11 per cent.

This group of 18 cases was then subdivided into three classifications. There were 9 cases of struma lymphomatosa, an incidence of 4.05 per cent; 3 cases of Riedel's struma, an incidence of 1.35 per cent, and 6 cases of chronic nonspecific thyroiditis, an incidence of 2.70 per cent.

It is probable that the diagnosis of chronic thyroiditis is at times used as a discharge diagnosis with a pathology report of hyperplastic or adenomatous goitre showing marked inflammatory changes. These cases should not be classified as a primary chronic thyroiditis and all such cases have been eliminated from our study.

The review of the slides at the Southern Baptist Hospital indicates that the record

room statistics at these two hospitals are fairly accurate and an incidence of 8 per cent or slightly higher of chronic thyroiditis can be accepted. This figure is considerably higher than the incidence of 4.06 per cent of chronic thyroiditis in our series of 172 thyroidectomies. The former percentage may be more accurate as it represents a larger number of cases over a longer period of time.

#### SEX

Riedel's struma may occur in both male and female, but is more common in women. Hashimoto's disease in men is rare and occurs almost exclusively in women. Chronic nonspecific thyroiditis may occur in males but is more common in women. All 7 of our cases of chronic thyroiditis occurred in women.

#### PATHOLOGY

Chronic thyroiditis, excluding the rare specific types, such as luetic or tuberculous, may for all practical purposes be divided into three groups:

1. Struma lymphomatosa or Hashimoto's disease
2. Riedel's struma
3. Chronic nonspecific thyroiditis.

Group 3 includes those cases of chronic thyroiditis that do not fit in group 1 or 2 and that are determined to be a primary thyroiditis rather than thyroiditis associated with hyperplastic or adenomatous goitre.

A study of the literature on this subject indicates that the giant cell type of DeQuervain should be included in group 3. The giant cell type of DeQuervain, according to Schilling,<sup>5</sup> is one variant of the protean manifestations of the thyroid gland to inflammation of bacterial origin.

In Hashimoto's disease, the thyroid gland shows grossly a diffuse regular enlargement. The surface shows a fine nodularity which is so marked at times that the pre-operative diagnosis of adenomatous goitre is made. The capsule of the gland remains intact and with the exception of the pre-tracheal region is free of adhesions. The tissue is rubbery in consistency and is generally pale white in color, but occasionally

may exhibit a brown-yellow cast. The cut surface of the gland appears divided into irregular lobules by fine fibrous trabeculae. There is present no normal thyroid tissue, little degeneration, and no necrosis or hemorrhage. As this condition occurs almost entirely in women, Schilling<sup>5</sup> called attention to the possibility that the functional demands on the thyroid in women may be a factor in the pathogenesis of struma lymphomatosa.

Microscopically, there is diffuse involvement of the entire gland which consists of a diffuse infiltration of lymphocytes. Numerous lymph follicles with germinal centers are present. The acini are small with oval to slitlike lumens. Generally, the epithelium of the acini is of the high cuboidal type with little or no evidence of degeneration. Occasionally, the lumen of an acinus is filled with a homogeneous mass which contains what appears to be degenerating nuclei. However, larger acini containing colloid are present which contain low cuboidal epithelium showing various stages of degeneration. Numerous large pale polygonal cells suggestive of the Hurthle type may be found arranged in acini, chords, and sheets. The cytoplasm of these cells usually takes an intense eosin stain. The nuclei of these cells vary in size and shape, are eccentrically placed, and contain fine chromatin and one or two small nucleoli. Fibrosis is present as a delicate interlacing structure and does not assume the dense sclerotic appearance that is associated with Riedel's struma. The blood vessels rarely show the changes associated with the latter condition.

In Riedel's struma, the gross appearance varies with the age of the process. The thyroid gland often presents a unilateral involvement. In the early stage, the gland is increased in size, is white in appearance, and is hard in consistency. At this stage the pericapsular adhesions may be minimal. The cut section of the involved gland is semitranslucent, pale white in color. DeCourcy<sup>4</sup> believes the disease process begins as a perithyroiditis rather than as an extension outward from the gland.

In the late stage, the gland is decreased in size, is grayish white, and is bonelike in its hardness. The pericapsular adhesions are diffuse and dense. The cut surface of the involved gland is opaque grayish white and contains an occasional semitranslucent area.

The microscopic picture in Riedel's struma also varies with the age of the disease. Fibrosis is the conspicuous element in all phases. In the early stage there is an acute degeneration of the acini in the involved area with the acini in the uninvolved regions being unaffected. The colloid seen in the involved areas is usually intercellular and contains nuclei of the degenerated epithelial cells producing the pseudogiant cells of Riedel's struma. The fibrous tissue is arranged in whorls surrounding and sometimes replacing the areas of degenerated acini and pseudogiant cells, giving an appearance of a granulomatous lesion. There is a dense infiltration of lymphocytes and leukocytes. Plasma cells, histiocytes, and true giant cells are also present. Occasionally there is a periarteriolar fibrosis and intimal thickening of the blood vessels in the involved areas.

In the late stages, the acini in the involved areas are markedly compressed or entirely absent with the acini in the uninvolved tissue being unaffected. Fibrosis is dense and sclerotic with hyalinization in some areas. A moderate number of lymphocytes and leukocytes may be present between the fibrous strands. An occasional lymph follicle with germinal center is present. The intima and media of the blood vessels in the involved area may show thickening. The foreign body giant cell granuloma may persist from earlier states. Hashimoto's disease begins in a normal thyroid gland, whereas Riedel's struma may begin in an adenomatous goitre.

The third group, chronic nonspecific thyroiditis, encompasses those chronic inflammations of the thyroid without specific etiology and which are not associated with hyperplastic or adenomatous goitres. Grossly there is little change in the gland, although there is some fibrosis and usually



some increase in size. The affected areas are usually irregular in arrangement and involve only part of the thyroid. Adhesions may be present but are not dense.

Microscopically, there are localized areas of fibrosis with an infiltration of chronic inflammatory cells. The acini may show some degenerative changes in the involved areas, but adjacent acini are not affected. An occasional giant cell is present, but there are no granulomatous type lesions. An occasional focal accumulation of lymphocytes is present but rarely is there a true lymph follicle. The blood vessels are usually unaffected.

Thyroiditis as a disease associated with a hyperplastic or adenomatous goitre is fairly common and is often responsible for the symptoms that bring the patient to see a physician. There were 14 of these cases in our series of 172 thyroidectomies. Microscopically this type of chronic thyroiditis cannot be differentiated from a chronic nonspecific thyroiditis except for the presence of the associated goitre.

Ten of these secondary chronic thyroiditis cases occurred with nodular goitres and 4 occurred with hyperplastic goitres. Marshall *et al*<sup>2</sup> point out that in hyperplasia of the thyroid gland there is frequently an infiltration with lymphocytes and often the formation of secondary lymph follicles. A small amount of fibrosis often accompanies the lymphoid infiltration, particularly in the later stages of involution. In adenomatous goitre fibrosis of the gland owing to hemorrhage or colloid spillage is frequent.

#### SYMPTOMATOLOGY

The chief symptoms in Hashimoto's disease are diffuse enlargement of the thyroid gland, tightness in the neck, a sense of pressure in the neck, and hoarseness. Hoarseness may be marked at times. Occasionally these individuals will exhibit the symptoms of mild hyperthyroidism with nervousness and tremor. Again these patients may exhibit the signs and symptoms of myxedema with puffy facies, falling hair, dry coarse skin, fatigue, weight gain, and slowness of body movement.

In the authors' 4 cases of Hashimoto's

disease 3 of the patients gave a history of hoarseness varying from several months to many years. All 4 had noticed enlargement of the thyroid gland. Two of the cases complained of a pressure sensation in the neck and 2 complained of nervousness. None of the 4 exhibited signs of myxedema when first seen, but 2 of the patients had a slight elevation of the basal metabolic rate above normal.

Riedel's struma causes more marked pressure symptoms in the late stages of the disease. Pain may be present at times. One of the authors' 2 cases of Riedel's struma had acute pain of several weeks duration prior to her first visit. Nervousness is a complaint and as suggested by Schilling<sup>5</sup> this is probably a secondary factor because of the anxiety state created by the dyspnea and choking sensations. The duration of symptoms in our 2 cases was twenty months in 1 and several years in the second case.

Chronic nonspecific thyroiditis may cause a sensation of tightness or pressure in the neck, depending on the stage of the disease. Hoarseness may be present as it was in the authors' 1 case. Mild hyperthyroidism may at times be manifested by nervousness and tremor of the fingers. The predominant symptoms in our single case were related to a mild hyperthyroidism. The initial basal metabolic rate was plus 37. This patient had been aware of enlargement of the thyroid gland for two years.

#### DIAGNOSIS

The preoperative diagnosis of chronic thyroiditis is not easy, as evidenced by the report of Marshall *et al*<sup>2</sup> of only 23.5 per cent correct preoperative diagnosis in these cases.

In our group of 7 cases of chronic thyroiditis the correct preoperative diagnosis was made in 3 cases, or 42.8 per cent. The greatest error was in the group of Hashimoto's disease, the correct preoperative diagnosis being made in only 1 of the 4 cases, or 25 per cent. The common error in struma lymphomatosa is confusion with an adenomatous goitre. This latter diagnosis is adhered to not only preoperatively,

but occasionally postoperatively by the operator.

If the examiner keeps chronic thyroiditis in mind while taking the history and during the examination the diagnosis of chronic thyroiditis should not be too difficult. A history of pressure in the neck and hoarseness should make one suspect the presence of a chronic thyroiditis.

Hashimoto's disease almost always occurs in women, usually of middle age. There is a bilateral symmetrical diffuse enlargement of the gland and the surface has a feel that has been adequately described as "pebbly-feeling." The gland is firm to the examining fingers and this should indicate to the examiner the possibility of thyroiditis. The so-called "pebbly-feeling" of the gland is often so marked that the diagnosis of adenomatous goitre is a frequent error.

The diagnosis in Riedel's struma is, as a rule, much easier to make than that of struma lymphomatosa. The marked pressure symptoms in the neck, plus the extreme hardness of the gland, should make the diagnosis obvious. This condition does not involve both lobes in a symmetrical enlargement, as does struma lymphomatosa. Riedel's struma is more common in women but does occur in males. Hoarseness may be a prominent symptom.

The differentiation of Riedel's struma from malignancy is difficult to make preoperatively and operation with biopsy should be recommended in these cases, if for no other reason than to rule out a malignancy, although operation for relief of pressure is usually necessary.

Hoarseness may be prominent in chronic nonspecific thyroiditis but is usually not as marked as in Hashimoto's disease or Riedel's struma. The gland in chronic nonspecific thyroiditis is as a rule slightly to moderately enlarged, with one lobe often being larger than the opposite. Pressure symptoms are often present, but not to the extent of Riedel's struma. The gland is firmer than that of a hyperplastic goitre and does not have the pebbly feel of Hashimoto's disease. Mild hyperthyroidism may be present.

#### TREATMENT

The treatment of Hashimoto's disease or struma lymphomatosa is bilateral partial thyroidectomy. This affords relief of the pressure symptoms which are a prominent feature of this disease. The hoarseness is not affected by the operation. These patients must be followed carefully postoperatively as the incidence of myxedema following surgery is high. All four of our cases of Hashimoto's disease developed myxedema postoperatively.

Other complications following operation are tetany and recurrent laryngeal nerve paralysis. None of these complications occurred in our 7 thyroiditis cases.

The treatment of Riedel's struma is operation. Operation is advised in order to relieve the pressure symptoms and also to rule out the possibility of malignancy of the thyroid gland. A conservative type of thyroidectomy is advisable in early Riedel's struma. This type of procedure was done in the authors' 2 cases. In far advanced Riedel's struma the isthmus only should be removed, as suggested by Lahey<sup>6</sup>. This latter procedure relieves the pressure and avoids the serious complications that might ensue if a bilateral thyroidectomy is attempted. These individuals must be examined frequently following operation, as myxedema is a common postoperative complication in all types of chronic thyroiditis. One of our 2 cases developed myxedema following a bilateral thyroidectomy.

The treatment of chronic nonspecific thyroiditis in most instances is surgical. Operation is advisable in most of these patients in order to relieve the pressure symptoms and to rule out malignancy. When the symptoms are minimal and the examiner is reasonably certain there is no malignancy present, conservative management may be justified. When there is doubt relative to the benign character of the lesion, operation should be done. A recent case seems to illustrate this point. A young woman, age 21, was seen because of a diffuse mass in the neck and a complaint of tightness in the neck. The thyroid gland was firm and both lobes were enlarged. A



diagnosis of thyroiditis was made, but because of the possibility of malignancy operation was advised. At surgery frozen sections were reported by the pathologist as malignant; therefore, a total thyroidectomy was performed. The final report was papillary cystadenocarcinoma.

Occasionally a patient with any one of these types of chronic thyroiditis will exhibit mild hyperthyroidism. In such instances propylthiouracil and Lugol's solution should be given preoperatively. Patients receiving propylthiouracil must be followed closely, as these individuals may become myxedematous after a relatively small dosage of the drug. The presence of myxedema is a contraindication to thyroidectomy and should be corrected before proceeding with surgery. Myxedema may be the cause of an obstructed airway if operation is attempted in the presence of the condition.

#### SUMMARY

A study of 172 consecutive thyroidectomies from the surgical services of the Mahorner Surgical Group at the Touro Infirmary and the Southern Baptist Hospital in New Orleans, Louisiana, reveals an incidence of 4.06 per cent of chronic thyroiditis. Out of the 7 cases of chronic thyroiditis, there were 4 cases of Hashimoto's disease, an incidence of 2.32 per cent; 2 cases of Riedel's struma, an incidence of 1.16 per cent, and 1 case of chronic non-specific thyroiditis, an incidence of 1.74 per cent.

A study of all thyroid specimens removed surgically at the Southern Baptist Hospital during the period January 1, 1945, to April 1, 1949, revealed an incidence of chronic thyroiditis of 8.11 per cent. Out of the 18 cases there were 9 cases of Hashimoto's disease, an incidence of 4.06 per cent; 3 cases of Riedel's struma, and incidence of 1.35 per cent and 6 cases of chronic nonspecific thyroiditis, an incidence of 2.70 per cent.

The symptomatology, diagnosis, pathology, and treatment of acute and chronic thyroiditis are discussed.

#### CONCLUSIONS

After study of a series of 172 consecutive thyroidectomies, a study of the record room statistics at Touro Infirmary and the Southern Baptist Hospital, and a review of all thyroid specimens removed surgically at the Southern Baptist Hospital during the period January 1, 1945, to April 1, 1949, the authors conclude that chronic thyroiditis is far more common in the Gulf States than in other sections of the United States.

Although the authors have no figures for comparison, it is their impression that acute thyroiditis is also more common in the Gulf States than in other parts of the United States.

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## CARCINOMA OF THE PROSTATE\*

A REVIEW OF MODERN MEDICAL AND SURGICAL TREATMENT

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BALTIMORE

The treatment of carcinoma of the prostate can best be discussed from two aspects; first, curative methods, second, palliative methods. It is generally recognized that in spite of the often spectacular

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results which occur as a result of estrogen therapy in the treatment of this disease, there is as yet no cure reported in the literature, controlled by pretreatment biopsy and either operative or autopsy findings, in which a five-year cure of the disease has been accurately demonstrated. The same fact is true in regard to radium or deep x-ray therapy, which methods, of course, have been largely superseded by the far more effective hormone influences, the knowledge of which we owe largely to the fundamental work of Huggins.

It therefore seems safe to say that in the present state of our knowledge, complete surgical extirpation of the prostate in its surgical capsule is the only method which we at present have available for permanent cure of cancer of the prostate. It is evident that, as in cancer elsewhere in the body, to effect such a cure an early diagnosis must be made before the growth has extended too far for complete radical excision and before metastatic deposits have occurred.

Unfortunately, carcinoma of the prostate is insidious in its early stages. It has been emphasized that the neoplasm arises in the posterior lobe in over 80 per cent of cases, and slowly invades the lateral lobes, often extending into the fascia surrounding the seminal vesicles before symptoms of urinary obstruction appear. Although this fact will probably always lead to an inevitable diagnostic delay, in many cases until the growth has extended too far for complete radical excision; on the other hand, it remains as a challenge to our diagnostic acumen and to the thoroughness of our diagnostic measures.

#### DIAGNOSIS

The diagnosis or the suspicion of early malignant disease rests entirely on the palpation of a hard nodule in the prostate on careful rectal examination. It is not the purpose of this presentation to discuss the pitfalls of differential diagnosis, but it is, of course, self-evident that all measures should be undertaken to exclude prostatic calculi—which can be done by simple x-ray

studies—tuberculosis of the prostate, and chronic prostatitis, the most common conditions with which cancer can be confused. In spite of the most careful studies there will always remain a certain number of cases in which the diagnosis can only be absolutely confirmed by perineal exposure of the gland and a frozen section biopsy. In the Brady Urological Clinic we have not practiced needle biopsy, possibly because we have never had sufficient confidence in our cytological experience, and furthermore, in this procedure there will always remain the doubt that the needle has obtained a specimen from the particular area under suspicion. We have in the past few months made some cytological examinations of expressed prostatic secretion with a modification of the Papanicolaou method, but the results have given us little help, possibly on account of the small series studied and our own inexperience. However, with a knowledge of the anatomy of the prostate in mind, it would appear to be extremely optimistic to expect to extrude by rectal pressure through normal lateral lobes a sufficient number of malignant cells to make a positive diagnosis from a small neoplasm limited to the posterior capsule.

The possibility of dissemination of tumor cells by manipulation of a neoplasm also arises. This question will always remain difficult to determine, if not insoluble; but if tumor cells can be dislodged in sufficient numbers to be recognizable in the expressed secretion, it is certainly possible, if not probable, that these free neoplastic cells might also invade the perineural lymphatics. Certainly the general surgeons would hesitate to massage a suspicious lesion of the breast to obtain material for microscopic study, and urologists, I am sure, would not consider it justifiable to exert pressure on a kidney tumor for the purpose of expressing cells which might be recognized in the urine; and certainly any undue manipulation of a testicular tumor has always been severely condemned.

It has therefore been our custom, when a tentative diagnosis of early carcinoma has been made, to inform the patient that



malignant disease is suspected and that if the diagnosis is corroborated by frozen section biopsy a radical operation will be done. With the patient prepared for the operation, the suspicious area in the posterior lobe is exposed in the usual manner, a generous biopsy obtained, frozen sections studied and if positive evidence of malignant disease is evident, the radical operation is forthwith carried out. If no evidence of cancer can be demonstrated in several satisfactory sections, the site of the biopsy is thoroughly coagulated, a retention catheter introduced and the wound closed.

The time consumed in making biopsy studies may vary considerably, but is approximately twenty minutes. We have found that this time can be very profitably used in thorough electrocoagulation of the site from which the biopsy was obtained and in complete mobilization of the prostate laterally until the blades of the tractor in the bladder can be easily felt, and posteriorly until the seminal vesicles can be palpated as far up as their upper extremities. Time thus spent in thorough mobilization will greatly expedite the subsequent steps of the operative procedure.

#### SELECTION OF PATIENTS

Careful selection of cases suitable for the radical operation is essential if morbidity and mortality are to be avoided and satisfactory postoperative results obtained. Certain criteria must be emphasized although they may be somewhat elastic. First, the obvious malignant induration must not extend beyond the capsule of the gland, into the membranous urethra, or extensively involve the fascia around the seminal vesicles, and the whole gland must be freely movable. Second, there must be no demonstrable metastases, either on physical examination or more particularly by x-ray studies, and the acid phosphatase determination should be within normal limits. Third, the patient should be a good surgical risk and, most important, his life expectancy must be good.

This latter point, we feel, is of paramount importance. Prostatic cancer is a slowly progressing disease in most cases and we cannot condemn too strongly the perform-

ance of the procedure in an elderly person whose life expectancy is obviously limited. In older individuals, generally speaking, muscle tone is to some degree at least impaired and the functional results following the operation will never be as satisfactory as when the procedure is carried out on younger men, more robust, and with good muscle tone. The criticisms which have been directed at the radical operation emphasizing unsatisfactory postoperative results, we feel are largely due to results in cases which should never have been subjected to the procedure. From the foregoing it has therefore been our custom to reserve the radical operation for those patients under seventy years, but the rule is by no means didactic as exceptions will always be found on either side of this limit.

The original concept of Hugh H. Young, who first devised and carried out the operation, was the complete removal of the prostate with the seminal vesicles and the fascia surrounding these structures up to their extremities. It is in this fascia and not in the vesicles themselves that extension of the neoplasm will be found if careful microscopic studies are carried out. Some writers have advocated various modifications of Young's original operation, including splitting of this essential fascia to isolate each vesicle separately, and even to divide the anterior commissure of the prostate itself to facilitate the operative procedure. By this technic the integrity of the fascia is violated and a true radical operation is not carried out.

#### RADICAL OPERATION

We feel very strongly that if the surgeon decides that an early carcinoma of the prostate is present and that the criteria, without which the radical operation should not be undertaken, are satisfied in the particular case under consideration, the most complete operative removal which is technically possible should be carried out. As an analogy, when general surgeons make a diagnosis of carcinoma of the breast, certainly no compromise is made and the most complete excision which is technically possible is performed.

No discussion of the technic of the operation will be presented except to emphasize the fact that after the excision has been completed great care must be taken in placing the sutures which unite the stump of the membranous urethra to the neck of the bladder. We have found that by employing Vest's principle in bringing these sutures out through the soft tissues of the perineum, an accurate approximation can be accomplished. In addition, this technic prevents the possibility of tying the knots directly over the external sphincter muscles, thus endangering their integrity with the possibility of resultant incontinence.

The radical operation entails no greater dangers than perineal prostatectomy for benign hypertrophy; in fact, the mortality is less. This can be explained by the fact that the radical operation is only undertaken in good risk patients in the younger age brackets, whereas perineal prostatectomy for benign hypertrophy is often undertaken in older, poor risk patients in whom the operator's purpose has been to perform a quick, nonshocking operation in the shortest time possible. During the past ten years 186 radical operations have been performed by various operators in the Brady Clinic with 6 deaths. In the last 100 cases there were 3 deaths, in the last 50 none. In a personal series of 70 cases there has been no mortality.

Spinal anesthesia is the method of choice. The position of the patient on the table is sometimes an ordeal and pentothal sodium is often administered when there is too much discomfort. Hemorrhage is never a serious problem. The key to this lies in the careful exposure and ligation of the lateral ligaments, and ligation of the tissues above the tips of the seminal vesicles. When the bladder wall in close proximity to the prostate is divided, bleeding vessels are often visualized and can easily be controlled, and following the anastomosis of the stump of the urethra to the anterior aspect of the bladder defect careful closure of this defect will control all intravesical bleeding. If oozing occurs from the depths of the operative site it can easily be controlled by oxycel

gauze, but we have found this rarely necessary.

In the older days of the development of the operation in several cases the ureters were obstructed, probably being included in the sutures used to close the bladder defect. With the excellent relaxation afforded by spinal anesthesia when the prostate in its capsule is excised from the neck of the bladder, a good visualization of the trigone and ureteral orifices can be obtained with adequate retraction and the integrity of these structures easily preserved. The intravenous injection of indigocarmine is of great help in recognizing the ureteral orifices and insuring their integrity.

Injury to the rectum has not occurred in the last ten years. Such an unfortunate complication would most probably occur during the exposure of the prostate before the urinary tract has been opened and should be easily recognized. Although I have never been faced with this complication, if it should occur the injury should be carefully repaired and the operation completed in the usual way, relying on the urethral catheter and the integrity of the rectal closure to prevent the development of a recto-urethral fistula.

The indwelling urethral catheter is allowed to remain about ten days, during which time the perineal wound will completely close in most cases, but occasionally persistent perineal leakage will necessitate the reintroduction of the catheter. Following removal of the catheter incontinence will persist for a variable interval of time, but complete control is usually reestablished within a month or less after the patient's discharge from the hospital. If there are any evidences of obstruction, manifested by difficulty, or a stream of small calibre and poor force, a careful dilatation of the urethra should be carried out, and in cases where incontinence is present this procedure will often result in great and immediate improvement in the functional result. In properly selected cases and with proper operative technic complete and permanent urinary incontinence does not occur.

The fact that, as a result of the radical



operation, sexual function is seriously impaired, if not totally abolished, must be faced frankly and patients should always be informed of this possibility. In our experience with most intelligent patients the possibility of complete excision of a malignant disease outweighs interference with sexual function. Following the operation it is now our custom to continue indefinitely the administration of estrogen in small doses in the hope that, if malignant cells have been left behind, they may undergo necrosis under this treatment.

#### SURVIVAL RATE

Several studies have been carried out (Young, Lewis, Colston and others) on the five year survival rate of patients subjected to the radical operation. These studies are in agreement that this rate is approximately 50 per cent.

Jewett has recently completed the first comprehensive study of the ten year survival rate, and in doing so has examined the clinical records and the specimens of 222 cases operated on in the Brady Clinic. It has been the custom in our clinic to record the impression of the examining surgeon's findings on rectal examination by means of a simple chart. Jewett's studies of these records and rectal charts convinced him that in many cases subjected to the radical operation there had been extracapsular extension of the growth before operation. He, therefore, in his study divided the cases into (a) those which showed no evidence of extracapsular extension on rectal examination and (b) those cases in which such extension was evident clinically. In Group (a), those with no demonstrable extracapsular extension, there was a ten year survival of 28 per cent, and "no patient who lived ten years without demonstrable recurrence of metastases subsequently showed evidence of cancer." This is, of course, a most significant finding. In Group (b) in which extracapsular extension was demonstrable, 7 patients lived six to nine years without evidence of cancer.

The question of local recurrence after the radical operation brings up some interesting points. Such recurrences become evi-

dent first between the bladder and the rectum so that they do not interfere with urinary function. They must arise from neoplastic cells which had invaded the fascia around the vesicles and before operation had extended into the fascia above the upper limits of these structures so that necessarily, because of technical limitations, they were left behind at the time of operation. As a rule, these cellular elements grow very slowly and have a tendency to extend upward, so that the site of the anastomosis between the stump of the urethra and the neck of the bladder is rarely, if ever, involved. We have no record of any case subjected to the radical operation in which subsequent urinary obstruction has developed due entirely to malignant recurrence. When recurrence after this operation does occur, death is due to the gradual extension of metastasis rather than to the result of urinary obstruction.

George G. Smith has been one of the most emphatic supporters of the radical operation, believing that it should be carried out in cases in which, on account of the extracapsular extension of the disease, there would seem to be no hope of a permanent cure. By this procedure the main mass of the disease is removed and there is no probability of subsequent operations necessary for the relief of recurring obstruction. It must be understood that the operation should not be undertaken when the gland is fixed or when extension too far into the fascia around the vesicles has occurred on account of the fact that under these circumstances the technical difficulties will be great and the subsequent functional result doubtful.

#### PALLIATIVE TRANSURETHRAL RESECTION

The introduction of transurethral resection for the relief of obstruction in inoperable prostatic cancer has been one of the greatest advances in the care of sufferers from this disease. Before this operation was perfected many of these patients were doomed to a permanent suprapubic cystostomy for the remainder of their lives. The only alternative to this palliative procedure was conservative perineal prostatectomy in

which the objective was to expose the gland by the perineal route and to remove by enucleation as much as possible of the obstructing malignant tissue. Often on account of the absence of line of cleavage between the posterior capsule and the obstructing tissue, sharp dissection and the use of a curette were found necessary. Inevitably, functional results were in some cases unsatisfactory with an occasional persistent perineal fistula, and varying degrees of incontinence persisted in some cases. Also, fixation of the gland to the rectum often made exposure difficult and injury to this structure was often a hazard. However, we considered then that conservative perineal prostatectomy gave far better results for the comfort and well being of the patient than its only alternative, a permanent suprapubic tube.

Transurethral resection has now almost completely superseded both conservative perineal prostatectomy and suprapubic cystostomy. The immediate results are usually most satisfactory and often brilliant, but in many cases, due to the fact that the neoplastic tissue around the neck of the bladder can never be completely removed by this procedure, recurrence of the obstruction, with the necessity of another resection, frequently occurs. In some cases satisfactory healing of the resected area never takes place, so that open ulcerations persist, followed by phosphatic incrustations with the resulting distressing symptom-complex of frequency, strangury and terminal hematuria which may make life a burden to the unfortunate sufferer. These sequelae can be avoided for the duration of the patient's life if surgical removal of all neoplastic tissue around the neck of the bladder is technically possible, even though a permanent cure cannot be expected.

#### REPORT OF CASE

It is always dangerous to quote an individual case, but in this connection the case of D. McM. comes to mind. This 60 year old man was seen in 1926 with increasing urinary symptoms. On examination a moderate grade of prostatic hypertrophy was found, but in the posterior capsule there was an elevated nodule, stony hard in consistency. A diagnosis of benign prostatic hypertrophy with a circumscribed area of malignant

disease in the posterior capsule was made and a radical perineal prostatectomy was done. Convalescence was uneventful except for temporary incontinence, and a few weeks after leaving the hospital he had regained complete control, which continued so throughout the remainder of his life. Study of the operative specimen showed benign prostatic hypertrophy with an area of well differentiated adenocarcinoma, which on microscopic study had invaded both lateral lobes and had extended into the fascia around the base of each seminal vesicle, the involvement being more pronounced on the left side.

He was seen at yearly intervals and no evidence of recurrence was detected until four years after operation when an indurated nodule, which was considered a definite recurrence, was palpated high up on the left side between the posterior bladder wall and the rectum. This nodule increased in size slowly through the years; there was never any interference with bowel function and he always had excellent urinary function with a normal bladder capacity, no residual, and perfect control both day and night. He died of coronary occlusion in 1940, fourteen years after operation, always retaining perfect urinary control and with no disturbance of bowel function.

Through the courtesy of the physician who performed the autopsy the genito-urinary tract and the rectum were made available to us for study. Between the left posterior bladder wall and the rectum there was an irregular mass measuring about 6 by 4 cm. This mass was adherent to both bladder wall and rectum, but had not invaded either of these structures, which explained the fact that there had been no interference with either urinary or rectal function. Microscopic studies showed the mass to consist of well differentiated adenocarcinoma similar in structure to the original tumor in the prostate excised fourteen years previously. In all probability this mass had grown slowly from cells which had been present in the fascia around the vesicles at the time of the original operation lying above the upper limits of the original procedure.

Had this patient been subjected to transurethral resection when he was first seen an appreciable amount of malignant tissue must inevitably have been left around the prostatic orifice, with recurrence of obstructive difficulties and further resection for relief inevitable. It is inconceivable that, had transurethral resection been chosen as the procedure of choice when the patient was first examined, he would have had a life span of fourteen years with normal urinary function and control, and no evidence of infection.

#### HORMONE THERAPY

Cancer of the prostate and metastatic growths from the original tumor have been proved to be dependent for their growth on androgen stimulation, and the fundamental



research of Huggins has demonstrated that when the effect of this hormone has been repressed, either by orchietomy or the administration of estrogen, in approximately 80 per cent of cases there will be a regression of both the original neoplasm as well as the metastases. Kahle and others have described the microscopic changes which occur in the neoplastic cells thus deprived of androgen stimulation, the chief manifestations of which are pyknosis of the nuclei, rupture of cell membranes, disintegration of malignant cells and necrosis.

Clinically, the results of elimination of androgen stimulation are manifested by marked regression of the neoplasm on rectal examination, often with complete disappearance of the induration in the fascia surrounding the seminal vesicles, so that in some cases all evidence of third degree induration will disappear and a diagnosis of malignant disease could no longer be made by the findings on rectal examination. Metastatic lesions will often show remarkable changes by x-ray examination and in some cases extensive lesions in bone will often completely disappear, apparently to be replaced by regeneration of normal bone structure.

The necrosis of malignant cells due to deprivation of androgen has been postulated by Huggins as due to interference with the enzyme mosaic of the individual cells. This cellular necrosis is most pronounced in the peripheral areas of the tumor where the malignant cells are younger and grow more actively and are therefore more dependent on androgen stimulation.

From these considerations it seemed possible that neoplasms which on first examination had progressed too far for complete extirpation by radical operation might, on estrogen therapy, regress to such an extent that the radical operation could be successfully carried out. On this account it has been our custom when a diagnosis of cancer of the prostate has been made to commence immediately the administration of estrogen therapy by means of diethylstilbestrol. In cases which on examination seem suitable

for radical operation, it has seemed to us that this therapy will cause death of some of the malignant cells at the periphery of the tumor so that the chance of a permanent cure will be definitely enhanced. In cases which seem on first examination to be too advanced for radical operation, regression of the neoplasm might occur to such an extent that the operation could be rendered technically possible in a case, which without this therapy would be considered inoperable and therefore hopeless.

A small series of 7 cases has been reported which on first examination showed that the neoplastic growth had progressed outside the capsule or far up in the fascia around the vesicles, so that the possibility of a cure by radical operation seemed obviously impossible. Under stilbestrol therapy the findings on rectal examination changed to such an appreciable degree that the operation was subsequently carried out in all these cases without technical difficulties. Microscopic studies of these operative specimens showed that while degenerative changes and necrosis of many malignant cells were evident, viable cells could usually be found in the fascia around the vesicles. All these cases were operated on four years ago or longer, and a follow-up report on them will be made when the five-year interval has elapsed for them all. At present writing one patient died within a year from operation of recurrence and metastases. One died three years after operation of cancer of the sigmoid which bore no relation to the original tumor, no evidence of which was clinically evident, but no autopsy was obtained. Four patients are alive, but have definite clinical evidence of recurrence, but have normal urinary function. One patient is alive and well three years and six months after operation with no clinical evidence of recurrence or metastasis.

This short series of cases which would have been considered inoperable before the advent of estrogen therapy on account of the local extent of their disease, were operated upon in the hope that a cure might be obtained in some of them, and also in the hope that their life expectancy might be

increased by the removal of the main mass of their malignant disease.

In those cases of extensive carcinoma of the prostate which do not regress sufficiently to justify performance of the radical operation, it has been our custom to continue estrogen therapy either with diethylstilbestrol, 1-2 mgm., daily, or ethinyl estradiol, 0.15 mgm., daily. These dosages are almost invariably well tolerated although, of course, some hypertrophy of the breasts with initial hypersensitivity may be expected. Larger doses of estrogens have been advised by some writers, but in our own experience we have not been able to observe any more favorable response with higher doses than with the smaller ones which we customarily employ. The only way to settle this question would be to have under careful observation a series of cases under small estrogen dosage. Inevitably, at varying intervals of time the estrogen treatment will begin to lose its inhibiting effect as evidenced by progression of the prostatic neoplasm and growth of metastases with pain. At such a time, if higher estrogen dosage could be shown to result in another regression of the local lesion and regression of the growth of the metastases with relief of pain, the case for higher dosages would be sustained. However, we know of no sufficiently well controlled series of cases in which this sequence of events has been clearly demonstrated.

It is not uncommon, of course, to see a case of advanced carcinoma of the prostate, with or without demonstrable metastases, with the presenting symptoms of acute retention. Estrogen therapy is immediately instituted and a retention catheter introduced. After a week or ten days the catheter is removed, and in some cases it will be found that sufficient regression of the neoplasm has occurred so that the obstruction is relieved and relatively normal urinary function may be regained and retained over an appreciable interval of time. This method is preferable to immediate transurethral resection on account of the fact that, with the growth of the neoplasm, obstruction will

recur and multiple resections be necessary, followed by inevitable infection.

#### ORCHIECTOMY

It has been our custom to reserve orchiectomy for these cases in which it has become evident that estrogen control of the disease has become ineffective. It is true that there is definite evidence that orchiectomy performed after a patient has been on stilbestrol therapy is often ineffectual and rarely gives the spectacular results which are so often observed when the operation is carried out without previous estrogen therapy. Nevertheless, in many cases treated by estrogens when it becomes evident that their effect in controlling the disease has begun to fail, orchiectomy in some cases at least will lead to definite alleviation of symptoms, although this is only temporary.

Conversely, when clinical evidence of progression of cancer of the prostate and its metastases become evident at varying intervals of time after orchiectomy has been previously performed, it is rare that the progress of the disease can then be favorably influenced by the institution of estrogen therapy.

Careful analyses of large series of patients with inoperable cancer of the prostate must be studied before definite conclusions can be reached as to the relative value of orchiectomy and estrogen therapy and the time that either one or both of these measures should be instituted. Creevy has advised that endocrine therapy should not be started until symptoms appear. He then gives estrogen therapy and when it is evident that this therapy has become ineffectual, an orchiectomy is performed. When an agent which is effective against cancer is known and its success has been so definitely proved, as is the case with endocrine therapy in carcinoma of the prostate, it would seem to be a mistake, at least on theoretical grounds, to withhold its use until the neoplasm had progressed to a sufficient degree to produce symptoms, even though sufficient statistical studies are as yet unavailable to support this point of view.

In the care of patients with far advanced



cancer of the prostate in whom estrogen therapy and castration have been proved ineffectual in the control of the disease, deep x-ray therapy will in some cases result in temporary palliation; and in rare cases where suffering from bone metastases has become unbearable, subarachnoid alcohol injections, or the administration of novocaine subdurally according to the method of Hingson, or finally cordotomy may give the patient sufficient relief to make his last days tolerable.

#### SUMMARY

A review of our present knowledge of carcinoma of the prostate has been presented with especial emphasis on the treatment of this disease. The great progress in the palliative treatment of this condition as a result of the institution of endocrine treatment, either by orchiectomy or administration of estrogens, has been discussed. In spite of the great alleviation of human suffering which has been accomplished by these very great advances in therapy, there is at present no case of permanent cure of cancer of the prostate by endocrine therapy recorded in the literature.

The radical operation offers us at present our only hope of complete eradication of this disease, and follow-up studies have shown that in properly selected cases subjected to this procedure there will be a five-year survival rate of approximately 56 per cent, and more significantly a ten year survival rate of 28 per cent.

The difficulties in early diagnosis have been discussed and the challenge that this very common disease, curable in its early stages, presents, has been emphasized.

No bibliography will be appended because the foregoing presents the personal views of the writer. The writings of Young, Geraghty, Bumpus, Hinman, and more recently Huggins, Nesbit, Vest, Creevy and Jewett, to mention only a few of those authors who have contributed to the literature on cancer of the prostate, are readily available.

## THE RETROPUBIC APPROACH TO VESICAL OBSTRUCTIONS

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Another era of prostatic surgery was established when Millin demonstrated his method of retropubic prostatectomy in 1945. One's first reaction agrees with W. K. Irwin's who stated that fashions change in the field of prostatic surgery with almost the same bewildering frequency as in that of dress. In actuality of course this is not true for prostatic surgery has progressed in an orderly fashion always being limited by the currently available means of controlling postoperative infection and bleeding.

The retropubic approach or anterior extravesical approach to the prostate through the space of Retzius is not a new concept. Basically this operation was suggested by Zucherkanl in 1906, by Van Stockum in 1909 and in 1922 by Lidski. Jacobs and Casper stirred the Western Section of the American Urological Association with their "prevesical prostatectomy" in 1933. For more than forty-three years this operation had been attempted and received intermittent attention but without a sufficient following or success to warrant adoption. Millin introduced a grossly simplified procedure which literally defied the accepted surgical dictum that the space of Retzius would not tolerate ingression. The sulfonamides and the antibiotics have bolstered the less adventurous surgeons.

We are not of the opinion that the retropubic operation is the universal answer to prostatectomy, but we feel that it has a place in the relief of certain instances of prostatic obstruction. This dissertation will present our experiences with retropubic surgery which include the conservative and radical methods of retropubic prostatectomy, and in addition, the relief of poster-

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ior urethral and vesical neck obstructions in children.

The retropubic prostatectomy employs an extravescical approach to the prostate which, though seemingly infrequently appreciated, is an extravescical structure. There is an additional advantage to the capsular incision which has not been given adequate consideration in the literature. This factor is the relatively greater blood supply of the prostatic capsule as compared to the bladder wall. To appreciate this point one needs only to glance at the illustrations of Farabeuf and Tsaknis who studied the blood supply of the bladder and rendered a most detailed anatomical description in 1905. The rapidity of capsular healing has been spectacular on the two occasions which we have studied. An aged individual developed a large strangulated vesical diverticulum following retropubic prostatectomy which defied catheter drainage. On the fourth day after prostatectomy it was felt that surgical interference was imperative to establish drainage but it was impossible to find the capsular wound. Hence, instead of draining the diverticulum through the capsular wound it was necessary to undertake a cystotomy. The second patient, who had a history of severe bleeding following other operations, developed a massive postoperative hemorrhage into the bladder. Although this occurred on the third morning following surgery, the capsular wound could not be defined and a cystotomy was used to effect vesical drainage. It was readily seen in these two instances that the capsular wound was firmly healed within seventy-two hours after surgery; and in the second patient not only was the capsular wound not readily visible or palpable but it withstood a very firm gauze pack which was used to control an extremely active hemorrhage from the vesical neck. This rapidity of capsular healing is a factor of great merit.

#### RETROPUBIC PROSTATECTOMY

In our opinion this operation is indicated in all instances of benign prostatic hyperplasia of medium or large size. We reserve the transurethral resection in nonmalignant

lesions for the small glands, fibrous vesical neck contractures, and fibrous prostates with obstruction. The transvesical or suprapubic prostatectomy is employed only in giant vesical calculi associated with prostatism and here only if the calculus measures by x-ray more than 4 cm. in diameter. In instances where a cystotomy has been necessary we still execute a retropubic prostatectomy and have been justified in every patient by a most benign operative and postoperative course. Although the perineal prostatectomy was our first love, we have abandoned this route except for an occasional demonstration or for old time's sake.

In the retropubic prostatectomy the prostate is exposed through either a longitudinal or transverse suprapubic incision which includes both the skin and rectus fascia. The rectus muscles are separated, the hypogastric fascia opened and the empty bladder displaced cephalad to expose the variable vascular endopelvic fascia overlying the prostate. Small gauze packs are inserted on either side of the prostate to facilitate prostatic delineation. If the veins are prominent they are individually doubly ligated and severed. If the endopelvic veins are not large they are disregarded and dealt with individually when bleeding ensues following incision of the prostatic capsule. It has been our practice to introduce a subcapsular suture at the apex of the bladder coursing across the anterior surface of the capsule to diminish bleeding from the capsular veins. We believe this step is an adjunct and were interested to note that Millin employs a similar technic which was reported in a recent account of one of his operative clinics.

After the prostatic capsule has been gently freed of its attached tissue the shining capsule is visualized. We then inject the adenoma, as Millin has advocated with a solution prepared by mixing 15 cc. of 1 per cent procaine with an ampoule of pitressin. Into each lateral lobe, with a needle point just below the capsule, an 8 cc. increment of this solution is injected. This definitely reduces bleeding during the period of enucleation and further it acts as



a means of hydraulic dissection of the adenoma from the false capsule. We have employed a variety of mixtures for this injection and are at a loss to explain why the procaine-pitressin solution is more effective than a saline-pitressin mixture.

The prostatic capsule is incised transversely at approximately 1.5 cm. distal to the vesicoprostatic junction. The length of the incision is dependent upon the size of the prostatic adenoma and is long enough to facilitate an atraumatic enucleation. All layers of the capsule are divided with a single stroke of the knife and the bulging adenoma can be seen in the opening of the capsular wound. Bleeding from capsular veins at this point may be brisk and adequate visualization is easily afforded by the use of suction. The individual veins are clamped and sutured for positive hemostasis. The operation as practiced by Millin is conducted entirely by electrocoagulation; however, we have not experienced similarly satisfactory hemostasis. It is to be recalled that these prostatic veins are actually venous channels which have a sparsity of muscle fiber and their attachment to the surrounding capsular tissue may defeat the usual effectiveness of electrocoagulation.

Following capsular hemostasis the prostatic adenoma is separated from the false prostatic capsule with scissors point dissection throughout its entire anterolateral circumference, and before delivering the gland into the retropubic space the posterior urethra is severed with scissors at the apex of the adenoma. When the gland is delivered from the capsule it is elevated as much as is possible in order to visualize its attachment to the vesical neck. The prostate is now attached to the bladder only by a mucosal cuff and this is cut across. The adenoma is removed and one can, for the first time, get a glimpse of the bladder cavity through the vesical neck. This entire procedure has been extravesical in both the approach and enucleation of the adenoma.

The prostatic arteries at the prostatovesical junction are sought and ligated with a figure of 8 suture. These arteries normally enter the prostatic capsule at its

junction with the bladder at the levels of 5 and 7 o'clock. If the arteries cannot be visualized, we usually place sutures at these levels. The vesical neck is then inspected for small bleeders which are lightly fulgurated. After the vesical neck is free of bleeding points a catheter is introduced through the urethra which transverses the prostatic fossa and enters the bladder through the vesical neck.

The prostatic capsule is closed using a continuous suture of No. 1 chromic catgut encompassing all layers of the capsule. The suture to control any postoperative capsular ooze must be started and terminated well beyond the angles of the capsular wound. All layers of the capsule must be closed since any redundant capsular edge is a potential source of bleeding postoperatively.

After a small drain is left in the space of Retzius the abdominal wound is closed in layers and the skin is closed. Vesical drainage is accomplished by the urethral catheter alone. A bilateral vasectomy is done to prevent postoperative epididymitis.

The wound drain is removed on the second postoperative day and the urethral catheter is removed on the fourth day following surgery. The urine will most often be of burgundy color for the first twelve to eighteen hours, the color of strong tea the second day, and clear on the third morning.

We have tabulated below a resume of our first 234 retropubic prostatectomies which are compared to 500 other methods of prostatectomy, the majority of which were done by the perineal route by the late Owsley Grant. As can be seen at a glance the results are comparable, as might well be ex-

TABLE I

	234 Retropubic Prostatectomies	500 Open Surgical Prostatectomies
Average Age	68.3	67.1 years
Total Period of Hospitalization	17.1	31.0 days
Postoperative Hospitalization	12.4	21.8 days
Catheter Period		
Postoperatively	6.2	11.6
Mortality	3.1	3.9 %

pected, since both procedures are extravascular methods of prostatectomy. It is to be noted further that some of the apparent improved figures in the retropubic group could well be occasioned by the fact that antibiotics and sulfonamides were available.

The mortality of 3.1 per cent in the retropubic group constituted 7 patients all of whom died within fourteen days postoperatively. One died on the fifth day of an acute coronary thrombosis; another, 78 years of age, had an uncontrollable cardiac decompensation and bronchopneumonia and died a cardiac death on the thirteenth day following surgery. A man of 66 years died of an overwhelming perivesical infection which had presumably been present, though undiagnosed preoperatively. He is considered as an ill chosen subject for prostatectomy. The patient would not tolerate either urethral or cystotomy drainage since both had been used in an attempt to avoid operation. The remaining four patients of 71, 69, 59 and 77 years died on the seventh, eleventh, thirteenth and sixth days postoperatively from bronchopneumonia, cardiac failure, uremia, and an infarct, respectively.

The surgical complications which prolonged hospitalization in the series of retropubic prostatectomies are noted below.

TABLE II

Complication	Percentage Incidence	Number of Fistula Patients
Suprapubic fistula		
temporary	0.8 %	2
Wound infection	4.7 %	11
Secondary hemorrhage		
from the prostatic bed	2.05 %	6
Osteitis pubis	0.8 %	2

Suprapubic fistula occurred in 2 patients. The first was a severe diabetic who presented a wound infection and a most difficult wound healing problem; the duration of the fistula was twenty-one days. The subsequent course of the patient has been excellent. The other patient was suffering with a huge, narrow mouthed diverticulum which could not be resected because of the patient's generally poor state. The fistula

healed on the twenty-seventh postoperative day.

Wound infection was recorded in any patient where there was induration of the wound and possibly some drainage thus causing the patient to be maintained in the hospital beyond the usually anticipated day of discharge. The longest period of hospitalization in this group was eighteen days.

Secondary hemorrhage from the prostatic bed occurred in 6 patients. Four of the group were so stricken during the period of hospitalization, and it was thought that the hemorrhage was due to bleeding from the prostatic arteries which had not been ligated. In two instances the bleeding was controlled by endoscopic methods employing electrocoagulation. A third patient suddenly developed moderate though persistent hemorrhages the day following removal of the catheter. The bleeding was finally controlled by traction alone. The fourth patient had a vesical hemorrhage on the third day after surgery while the urethral catheter was still in position. The bladder filled with clots and an immediate cystotomy became a life-saving measure. The source of the bleeding seemed generalized from the vesical neck and it was instantly controlled with gauze packs. In each of the above patients the remainder of the hospital course was uneventful. The remaining 2 patients suffered secondary hemorrhage following the seventh postoperative day; 1, on the day of discharge; this was controlled by a Foley bag. The other hemorrhaged on the eighteenth postoperative day, three days following discharge from the hospital, and this was restrained by electrofulguration cystoscopically. Secondary hemorrhage from the prostatic bed is a hazard of prostatectomy from which no method thus far has been immune.

There were two instances of osteitis pubis, both of which continued for approximately six months. One patient was a hugely obese, diabetic whose convalescence was delayed by poor wound healing. The other patient's convalescence was uneventful until the third week postoperatively



The appearance of osteitis pubis in the literature in connection with this operation seems to have been all too frequent and this constitutes certainly a most valid criticism. It is to be remembered, however, that the syndrome may well have been not so clearly recognized in the past and many instances may have gone undiagnosed and thus unreported following other methods of prostatectomy. We have seen one instance following perineal prostatectomy and recently Rosenberg and Vest reported two instances following transurethral resection.

#### RADICAL RETRO PUBIC PROSTATECTOMY

The approach to the prostate in radical retropubic prostatectomy is identical with that used in the conservative operation. After the gland has been exposed and the paraprostatic fossa on either side delineated, the finger is inserted laterally at the apex of the gland and with gentle dissection the finger is passed as far as possible around the apex of the prostate. After the prostatourethral junction has been encircled a ligature is passed around the apex of the gland. The prostatourethral junction is distinctly palpable due to the firmness of the previously introduced No. 16 F. Nelaton catheter. The ligature is now tied tightly distal to the prostatic apex. This ligature compresses the dorsal veins entering the plexus of Santorini and materially reduces the bleeding upon division of the urethroprostatic junction. This step is best accomplished with a long scissors rather than a knife dissection.

After the prostate has been severed from the urethra, the urethral opening in the prostate is obliterated by applying a Lahey forceps to the apex of the gland to close the urethra and assist in elevating the prostatic apex in the dissection of the gland from the posterior structures. The prostate is elevated and freed from the rectum by blunt dissection. It is to be noted at this time that unless particular layer dissection is practiced it will be found that Denonvillier's fascia will adhere to the prostate and the rectum alone is displaced. We have not made any attempt to preserve a layer of Denonvillier's fascia over the rectum.

As the prostatic apex is elevated further, prostatic pedicles containing arteries to the gland are demonstrated. The pedicles are doubly clamped, tied, and severed. Following this the seminal vesicles covered by Denonvillier's fascia come into view. Denonvillier's fascia is cut across at the base of the prostate. The vasa deferentia are visible, and lateral to these structures lies the proximal portion of the vesicles. The vasa are dissected free and after a 5 cm. length has been obtained they are severed between ties.

The seminal vesicles are now dissected free to their distal portion and in this adherent tissue are small vessels to the vesicles. This tissue is doubly clamped, ligated, and severed.

The prostate is cut free of the bladder by opening the bladder at the anterior margin of the prostatovesical junction. The incision is continued around the entire base of the prostate, and the gland, with the attached vesicles and vasa deferentia, is removed.

Bleeding points on the vesical neck, which are usually few, are fulgurated and the bladder neck is attached to the urethral stump with sutures. Soon after the prostate is cut free of the urethra there are discovered most often bleeding points on the posterior urethral cuff. These bleeding points occur at the positions of 5, 6, and 7 o'clock. The bleeding vessels are controlled with transfixion sutures which are left long. These sutures are now used as the inferior sutures in attaching the bladder to the urethra. Before the sutures are tied at least two additional sutures are placed at the levels of 10 and 2 o'clock. A No. 22 Foley is passed through the urethra into the bladder.

After the sutures have been tied and the bladder neck has been approximated to the urethral stump, the residual opening in the bladder is closed with interrupted sutures so that the vesical outlet approaches the caliber of the urethra. A final mattress suture is now taken which approximates the residual edges of the bladder and then penetrates the urethral stump at 12 o'clock

position.

The abdominal wound is now closed in layers and a small rubber drain is left in place for two days. The urethral catheter is removed on the seventh postoperative day. In some of our earlier patients we were troubled with prolonged stress incontinence, but this has not occurred in later patients since greater care has been used in placing the urethral sutures and in utilizing the ligature sutures to minimize the number of sutures in the urethral stump.

We have executed a total of 13 radical retropubic prostatectomies, all but one being for carcinoma. Our criterion for the radical procedure is a clinical diagnosis of early carcinoma of the prostate without glandular fixation particularly at the apex. We have also employed the radical operation with excellent results in a firm fibrous prostate associated with severe subjective irritation. The results with this operation have been gratifying and we feel that its merit lies in the easily visualized seminal vesicle dissection. It is true that the anterior approach does not permit biopsy of the suspicious prostatic nodule.

#### RETROPUBIC SURGERY IN INFANCY AND CHILDHOOD

We have employed this surgical route to deal with vesical neck and posterior urethral pathology in infancy and childhood. These lesions in the past have been approached either transvesically or transurethraly and neither method in our hands has proved entirely satisfactory. The transvesical approach characteristically lacks adequate visualization and positive hemostasis in vesical neck pathology. The transurethral approach has certain imposed mechanical limitations particularly in infants. We are aware of their apparent satisfactory use in some clinics but our experience has not been entirely without dissatisfaction.

We approach the prostate in precisely the same manner as the adenoma is approached, but instead of using a transverse capsular

incision a longitudinal incision is employed which extends from the apex of the gland to the prostatovesical junction. At the superior angle of the incision the lateral branches of the prostatic venous plexus are divided and these vessels are ligated with a single suture on each side of the incision. These sutures are left long to act as tractors and when lateral tension is exerted the entire posterior urethra and vesical neck are adequately exposed for visualization and palpation. We mention palpation particularly since in two instances where the vesical neck obstruction appeared visually to be relieved, we palpated some dense underlying tissue. This was removed and the vesical neck could then be visualized and palpated free of any obstructing tissue.

Following the removal of the tissue about the vesical neck the bleeding points which occur at approximately 5 and 7 o'clock are ligated with a suture of fine catgut and immediately the wound is dry. The prostatic capsule is approximated with a running suture of fine chromic catgut after a catheter of small caliber is introduced into the bladder per urethram. The abdominal wound is closed in layers and a drain is left in place for two days. The catheter is removed on the fourth day and voiding in these children is spontaneous and uncomplicated.

We have now treated 4 such children from three months to nine years of age with excellent results. Where the upper urinary tract was uninfected preoperatively the urine was free of any cellular elements within eighteen days postoperatively. In only one instance, a three month old child, did a suprapubic fistula occur and it closed spontaneously after the catheter was reinserted for a four day period. We have followed 1 of these children for more than a year postoperatively and another for a nine month period; the remaining 2 have been observed six and five months respectively. Where an elevated NPN was stabilized preoperatively by catheter drainage, the level



obtained did not change after operation. Morbidity has been surprisingly insignificant.

## SUMMARY

The methods of conservative and radical retropubic prostatectomy are presented. A comparative study of 234 retropubic conservative prostatectomies and 500 perineal prostatectomies is outlined along with a brief discussion of the complications encountered in the retropubic group.

The application of the retropubic method in dealing with various types of vesical outlet obstruction in children is advocated and its application in 4 patients reported.

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## THE SURGICAL MANAGEMENT OF URINARY TRACT INJURIES\*

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## SHREVEPORT

Successful management of injured organs of the urinary tract depends upon strict adherence to four important points: (1) the treatment of shock when present; (2) arresting hemorrhage; (3) surgical repair of the injured organ; (4) ample provision for drainage of extravasated urine.

## THE KIDNEY

The clinical evidence of renal injury will be one or more of the following: (1) pain in the renal area; (2) shock; (3) hematuria; (4) a palpable mass in the flank. Of these four, pain is the only constant finding and may be either mild or severe. Shock may be absent at first but develops in a matter of a few hours depending upon the amount of blood loss, either through the urinary tract or into the perirenal space. The amount of initial shock also depends upon whether there is associated injury to adjacent organs. Hematuria is variable, if present, and its quantity is no indication of the extent of injury to the kidney.

The kidney may be severely traumatized but no hematuria be present, due to: (1) blockage of the ureter with blood clots; (2) severance of the ureter; (3) detachment of the kidney; or (4) severe vascular injury with renal infarction. A palpable flank mass is evidence of perirenal extravasation of blood, or urine, or both.

In attempting to evaluate the seriousness of renal injury several factors are to be considered: The first is the condition of the patient. Even though the voided urine is grossly bloody and pain is severe, if the

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condition of the patient is good and there is no mass palpable in the flank, conservative treatment is in order. If, however, the patient is in profound shock and is not responding to shock treatment, one should suspect that the renal pedicle is lacerated.

In some cases the history of the injury may be helpful in deciding the extent of the injury. The kidney, being a movable organ, is more likely to escape serious injury if the blow comes from the rear. In this case, the kidney would not be impinged against any immovable organ. However, if the force of the blow comes from in front or from the side, the kidney would be forced against the vertebral column and serious injury would be more likely to result. There are, of course, exceptions to this rule. Excretory urograms (intravenous pyelograms) are at times helpful in determining the extent of the injury. If the dye is well concentrated and confined to the kidney and ureter, extravasation of urine can be ruled out. However, if the dye is seen to be diffused throughout the perirenal area, this is evidence of complete rupture of the kidney or pelvis with extravasation. The excretory urograms will also reveal the status of the opposite kidney, which is essential if removal of the injured organ is considered. When in doubt, cystoscopy and retrograde pyelograms will clinch the diagnosis.

Whether or not surgical intervention is necessary will then depend upon: (1) the condition of the patient, and (2) the extent of the injury. Injuries of the kidney range all the way from mild contusions and lacerations to complete fragmentation of the organ and laceration of the pedicle. If surgery is deemed advisable, it must necessarily be in the nature of an exploration, being prepared to do whatever seems necessary. If associated injury to other abdominal organs is suspected, the transperitoneal approach is in order. If, however, the kidney is apparently the only injured organ, the classical lumbar approach is better.

If clots are present in the perirenal space, they must be evacuated. If the capsule of the kidney is not torn but a hema-

toma is present underneath, it is best to incise the capsule and liberate the trapped blood in order to prevent future fibrosis with atrophy of the kidney. The kidney has remarkable recuperative powers, and, even though it may be found fractured into several pieces, successful repair can be done by placing pads of fat or some type of hemostatic gauze, such as Oxycel, between the fragments after which the fragments are approximated to something resembling the normal anatomical kidney, using mattress sutures of chromic 1. These sutures are tied over pieces of fat to prevent their cutting through the kidney tissue. Ribbon catgut is preferable, if available. This type of catgut is weaved in and out of the capsule to form a basket-like sling. The ends are tied to approximate the fragments. Tears of the pelvis are lightly closed with chromic 0000. Penrose drains are placed above and below the kidney before the incision is closed.

To summarize, conservative treatment is justified in renal injuries as long as the condition of the patient remains good. If, however, blood pressure and hemoglobin are dropping and the pulse rising, continuous or increasing hemorrhage should be suspected and exploration carried out. Exploration should be done in all cases where there is a palpable flank mass present.

#### THE URETERS

Ureteral injuries result either from trauma or surgical accident. Ureteral trauma is very rare due to the mobility and the small size of the ureter. The majority of ureteral injuries occur incident to operations on the bladder and female pelvic organs. These are frequently recognized at the time they occur and immediate repair may be accomplished. If the ureter is completely severed, the ends may be sutured over an indwelling catheter. If such catheters are not available, a T tube may be used, one arm of the T extending up and one down the secured ends of the ureter. Often the ureteral injury, when unilateral, remains unobserved, and the kidney dies silently or with insignificant symptoms. The common postoperative indication of open



ureteral injury is a urinary fistula, the urine escaping by way of the vagina or operative incision.

#### THE BLADDER

Injuries of the bladder should be suspected in all lower abdominal injuries and pelvic fractures. Clinical evidence of bladder injury may be entirely lacking at first, or may be suspected, if the patient has an intense desire to void but is unable to do so, or at most passes a few drops of bloody urine. He should be catheterized, and, if there is doubt as to whether or not the bladder is intact, a measured amount of sterile water should be injected through the catheter and the recovered amount also measured. At least 300 cc. should be injected. If all of the water is recovered, one may safely assume that the bladder is intact. If possible, in cases of doubt, a cystogram should be made by injecting at least 300 cc. (one-fourth strength) of one of the opaque substances used for intravenous pyelograms, such as Skiodan or Diodrast. These substances are nonirritating to the surrounding tissues in case bladder rupture is present. Bladder ruptures may be intraperitoneal or extraperitoneal, and it may be impossible to determine preoperatively which type of rupture is present. If the rupture is intraperitoneal, symptoms of peritonitis do not appear early. In fact, the peritoneum is very tolerant of sterile urine. If the rupture is extraperitoneal, extravasation of urine will take place into the perivesical tissues, but again this will not be clinically evident for many hours.

Early surgical intervention is extremely important in rupture of the bladder. If rupture cannot be proved but is strongly suspected, one is fully justified in exposing the bladder to settle the question. The treatment will depend upon the condition found. The peritoneal cavity should be explored. If the rupture is intraperitoneal, the laceration will be found on the posterior wall of the bladder. The urine is aspirated from the peritoneal cavity, the bladder repaired, using medium size chromic, and the peritoneum closed without drainage, or with a small drain brought out through a

stab incision. After the peritoneum is closed the bladder should be opened extraperitoneally and a de Pezzer catheter anchored in the dome of the bladder. Drains are placed down to the base of each side of the bladder before the incision is closed.

If the laceration is found to be extraperitoneal, it is closed and a de Pezzer catheter placed in the dome of the bladder. If the laceration is very small and not easily accessible, it may be ignored, but in all cases the de Pezzer catheter should be placed in the bladder and ample drains placed down to the base of the bladder on each side. The drains should be left in place from five to seven days. The de Pezzer catheter is usually removed in about ten days.

#### THE URETHRA

Rupture of the urethra should always be suspected in pelvic fractures, injuries of the perineum, and particularly, in straddle injuries, such as falling astride a hard object. The clinical evidence is pain, shock (may be entirely absent), and retention of urine. The patient may pass a few drops of bloody urine on his first effort.

The most common sites of rupture of the urethra are the bulbous and the membranous portions. When urethral injury is suspected the patient should be immediately catheterized. If this is successful, rupture of the urethra can, as a rule, be eliminated. Evidence of extravasation of urine will not be evident at first. If the rupture is in the bulbous urethra, extravasation will take place deep to Colles' fascia, which is continuous with Scarpa's fascia on the abdomen. In due course of time clinical evidence of extravasation will be present throughout the scrotum, and, if allowed to continue, will spread up the abdominal wall.

If the membranous or prostatic urethra is ruptured, extravasation takes place above the urogenital diaphragm in the space of Retzius, but again this will not be clinically evident for many hours.

Early surgical intervention is essential in all cases of rupture of the urethra. Primary repair of the ruptured portion is ideal, but may be impossible to carry out due to the condition of the patient, and in

some cases due to associated pelvic fractures. If primary repair is not possible immediately, cystoscopy is performed plus ample drainage of the areas of extravasated urine. In this case secondary repair of the ruptured urethra should not be delayed longer than absolutely necessary, because dense scar tissue will form at the site of rupture and make further repair extremely difficult.

If primary repair is considered feasible, the approach will depend, of course, on the site of rupture. If the rupture occurs in the bulbous portion, it may be exposed through the perineum and a search made for the torn ends of the urethra. If found, they should be approximated over an indwelling urethral catheter using a few sutures of fine chromic. Ample drains should be placed in all areas of extravasation before the incision is closed.

Ruptures of the membranous and prostatic urethra are not easily accessible, and successful repair may require combined cystotomy and perineal exposure with the patient in the exaggerated lithotomy position. For successful repair each end of the urethra must be located. This may be accomplished by passing a sound through the urethra to the point of rupture and then passing another sound in a retrograde manner through the bladder from above. Then, through the perineal exposure the ends of the two sounds are located, which will denote the site of the rupture. The tissues overlying the two sounds are then incised and the two ends of the urethra located. The sounds are then removed and a catheter is passed through the urethra and guided into the bladder from the perineal side. The urethra is loosely approximated with fine chromic. The perineal incision is closed with ample drainage, after which a de Pezzer catheter is placed in the bladder before it is closed, with ample provision being made for drainage of the perivisceral spaces.

In conclusion, one should remember that early surgical intervention is essential in all injuries of the lower urinary tract where rupture of the bladder or urethra is proven

or strongly suspected. However, in injuries of the kidney, early surgical intervention is the exception rather than the rule, and one should adopt a conservative attitude as long as the patient's general condition remains good.

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## DIFFICULT LABOR IN RELATION TO FORCEPS DELIVERY\*

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AND

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The management of dystocia, or difficult labor, continues to be one of the most important phases of obstetrics, in spite of prognostic refinements of pelvimetry and the increased safety of cesarean section.

Because of this, we felt that a critical analysis of our most difficult deliveries throughout the years would contribute lessons of service and bring out principles of value in the future management of such deliveries, for dystocia problems will surely always be encountered. Consequently, we reviewed the records of about 3,000 operative deliveries, occurring during the years of 1932 through 1948, on the obstetric service of the Section on Obstetrics and Gynecology of the Mayo Clinic. In this period, about 12,500 deliveries occurred. The records of 5 patients who had extremely difficult deliveries prior to 1932 came to light in the survey and are included. A total of 86 cases was selected, although we are sure some very difficult deliveries were overlooked. The incidence of extremely difficult deliveries, therefore, was 0.69 per cent or about 1 for each 145 deliveries.

It should be emphasized that these cases represent the most difficult deliveries through the pelvis in a sizeable group of obstetric patients over a seventeen-year

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period. Many were admitted in labor with or without prior attempts at delivery and with no opportunity for prenatal study and planning for the best type of delivery. We seemed committed in these cases to operative delivery from below. In many other cases, in spite of prenatal care in our own group, we found "judgment difficult and experience fallacious" so that honest errors in judgment gave us these very hard forceps deliveries. The experience presented is that of our own group and we know the results are correct even though not always flattering.

The records of the cases were studied and the facts will be presented in the following sequence: parity, type of delivery, type of pelvis, quality of uterine contractions, length of labor and weight of the fetus. We then studied the incidence and nature of subsequent deliveries and finally the maternal and fetal results. We were especially interested in the remote results of these difficult deliveries on the fetus.

#### PARITY

For 66 patients, it was the first delivery and for 16 the second delivery. The remaining 4 patients were multiparas, having had 2 to 4 previous deliveries. In each instance of multigravity but 2, the babies were decidedly larger than those previously delivered, this fact causing the dystocia.

#### TYPE OF DELIVERY

Except for 1 craniotomy and 3 breech deliveries wherein unusual difficulty was encountered in the application of forceps to the after-coming head, all deliveries were by forceps with the vertex presenting. There were 18 low forceps deliveries, 60 midforceps deliveries and 4 high forceps deliveries.

The 4 cases of high forceps delivery require some comment. We subscribe emphatically and heartily to the idea that the employment of the high forceps operation is, in general, poor obstetric practice. On the other hand, we feel that there are exceedingly rare exigencies wherein the employment of the high forceps procedure is justified or even indicated. With 4 instances of this type of delivery in 12,500

deliveries (1 in 3,125 patients), it is seen that its use was very infrequent. Two of the 4 high forceps deliveries occurred in 1932, the first year included in this study. In 1 instance, the baby was dead at the outset and high forceps delivery seemed to the physician to be a less traumatic procedure than did craniotomy on a high head in a patient with severe pre-eclampsia complicated by pulmonary edema.

In the remaining 3 cases, we feel that high forceps delivery gave the infant its only chance of survival, and 2 of the 3 infants did survive without injury, 1 of the 3 being stillborn. The following mention of 1 of the 4 cases may exemplify the uncommon indication for high forceps delivery.

A 23 year old woman, gravida 2, para 1, was admitted in 1945 with profuse hemorrhage from a marginal placenta previa. She was given 2,000 cc. of blood and the hemorrhage was controlled by Voorhees' bag. When the bag was expelled the placenta was about four-fifths detached and in the vagina, yet the heart tones were audible, though indistinct and irregular. The head was high in the pelvis and could not be engaged with fundal pressure, though the baby was small. The uterus was dry and there was not time enough to secure the desired relaxation by anesthesia to perform a version and extraction. The occiput lay in the right occipito-transverse position; high forceps were readily applied, and rotation and descent easily accomplished. The placenta came over the perineum ahead of the fetal occiput, but the fetus, weighing only 2,710 gm., responded in five minutes to the usual treatment for asphyxia and the child is now 3 years old, alive and well.

In another instance of a primipara, the cord prolapsed just as the cervix was almost dilated with the head of an average-sized fetus at a station slightly above the ischial spines. A relatively easy application of high forceps resulted in the delivery of a normal infant but this woman suffered from the only ruptured uterus in this series, in spite of the fact that the application of the forceps and the traction required did not seem to the physician to be excessively traumatic. This case points out the gravity of high forceps delivery, and on the rare occasions when it is used, the physician must realize the grave responsibility he undertakes.

## TYPE OF PELVIS

A surprising fact appears when the pelvic measurements, determined by the usual office methods or by more exact modern methods of roentgenologic pelvimetry or by both, are studied. Forty, or nearly one half, of the patients had apparently normal pelves. This number is perhaps too high as many were seen before present-day accurate pelvimetric methods were available. Yet, we believe that many of the 40 did have what could be termed adequate pelves because, first, they were found to have adequate pelves on recent remeasurement or, secondly, they had delivered fetuses of excessive size. Twenty-five women of the group had some definite degree of pelvic contraction. Twenty-one had quite severe degrees of pelvic contraction.

No doubt many of the patients with so-called normal pelves had pelves that were inadequate for the large fetuses they bore. That is, in spite of normal pelvic measurements there was cephalopelvic disproportion. In 9 of the patients with normal pelves the dystocia occurred as the result of other factors than the babies' size. Such factors were locked twins in 1 case, prolapsed cord, placenta previa, hydrocephalus and so forth. In the remaining 31 cases, however, wherein the pelvis was normal, the *average* fetal weight was 4,000 gm. More will be mentioned later as to the importance of fetal weight.

## QUALITY OF UTERINE CONTRACTIONS

The uterine contractions were unsatisfactory to the extent that they were fair or poor in quality in exactly half of the cases. This was not an unexpected finding but bears out the impression that uterine inertia is a disturbing and annoying accompaniment in cases of dystocia. The obstetrician has cause to yearn for good uterine dynamics when his dystocia suspect goes into labor.

## LENGTH OF LABOR

As would be expected, the length of the first stage was often prolonged. Forty-two, or nearly one half (48.8 per cent) had labors that lasted twenty hours or more and 22, or one quarter, had first stages of

labor that lasted thirty hours or more. The average duration of the first stage for the group was 24.8 hours.

There was a considerable variation as to the time that patients were allowed to remain in the second stage. For example, 31 patients were delivered by forceps operation before the cervix had been completely dilated one hour. Nine patients who had Dührssen's incisions are included in this group, as well as some of the multiparous patients. Maternal and fetal exhaustion accounted, also, for rather early interference after complete dilatation had been attained in some cases. Ten patients were allowed to remain in the second stage for four to seven hours. Two patients had a second stage of more than ten hours; in 1 of these, there was uterine inertia.

## WEIGHT OF FETUS

The fetal weight was the only accurate measurement on the records that seemed indicative of fetal size, and we were impressed with the importance of fetal weight in these examples of extreme dystocia. Sixty-five, or 75.6 per cent, of the babies were above the usual yearly average in fetal weight (3,325 gm.) of clinic patients; the average weight of the 86 babies was 3,714 gm. Twenty-eight, or one third, of the babies, weighed more than 4,000 gm.

## SUBSEQUENT DELIVERIES

The future of the 86 mothers following their experience of extreme dystocia is of much interest. They remained unusually infertile, as is evidenced by the fact that apparently only 33 of the 86 women went through a subsequent pregnancy. These 33 women had a total of only 45 babies subsequent to their experience of the original hard labors and deliveries. From examination of the case records, we do not believe that there were many instances in which they sustained enough morbidity to render them sterile, but rather the infertility was voluntary. Either the patient or her husband, or both, did not wish to risk a similar ordeal again. While this attitude is understandable, it may not be logical because those who did venture another pregnancy were delivered of normal babies with



relative ease, except for 3 repeated mid-forceps deliveries. So far as we can ascertain, there was no fetal mortality or morbidity in the 45 deliveries following the dystocia.

The fetal weight is again of interest in these subsequent deliveries. In 20 of 27 cases in which records were available and in which the delivery was through the pelvis, the weight was less than that of the infant presenting the original dystocia. In 3 of the 7 exceptions other obstetric difficulties explained the discrepancy. The prior clinical impression of one of us (A.B.H.) that often a patient having dystocia as a primipara will deliver a heavier baby with ease (the primary dystocia being attributed to uterine inertia or "soft part dystocia" rather than to real disproportion) is largely refuted by this study. The weight of the fetus in subsequent deliveries was frequently 500 to 1,300 gm. less than in previous deliveries. The patients undergoing cesarean section in pregnancies following their dystocia had, in 9 instances, fetuses whose average weight was 4,014 gm.

#### MATERNAL RESULTS

As inevitably happens in such a series of difficult operative deliveries, there was considerable trauma and loss of blood. The blood lost was normal (less than 500 cc.) in 43 cases. In 10 cases, the loss of blood was excessive, but transfusion was not required. Thirteen patients either sustained enough hemorrhage (estimates of 500 to 2,000 cc.) to require transfusion of blood or went into shock without hemorrhage. Six patients received 1,000 cc. or more of blood. A ruptured uterus accounted for the hemorrhage in 1 case and placenta previa augmented the loss of blood in 2 others. There was no maternal death in the 86 cases.

#### IMMEDIATE FETAL RESULTS

There were 8 stillbirths and 4 neonatal deaths in the 86 deliveries, giving an uncorrected fetal mortality rate of 14 per cent. One infant was macerated and a high forceps delivery, even though the infant was dead, seemed preferable to a craniotomy on a high head, since the mother was

in precarious condition with severe pre-eclampsia and pulmonary edema. Congenital anomalies incompatible with life caused the dystocia in 2 cases. Another patient was admitted with a large fetus and delivered save for the head, requiring a craniotomy on the after-coming head. In a fifth case, a marginal placenta previa probably contributed to a stillbirth of a 5,400 gm. fetus. The corrected infant mortality was, then, 7 infant deaths, or a rate of 8.1 per cent, in which operative trauma destroyed the fetus. Many babies had various evidences of delivery trauma on the head, such as forceps bruises, cephalohematomas, and transient facial paralysis. Two infants had external eye injuries from forceps, 1 requiring suture of the eyelid, but with quite satisfactory late results.

#### LATE FETAL RESULTS

The remote fetal results of these difficult deliveries were of special interest to us. Twenty-one of the 74 infants who survived were dismissed from the hospital at the end of the neonatal period or slightly before (average of about eleven days) and have never returned to the clinic. This is, admittedly, an unsatisfactory follow-up. All were neurologically and otherwise apparently normal, although 1 infant had had one jacksonian convulsion soon after birth. The records of 20 of these babies were examined to ascertain these results.

In 10 other instances, the mothers' records indicated that the babies went home in good condition, but no follow-up data were available. This left 43 infants who have been followed-up for six weeks to twenty-six years. Of these 43 babies, 5 were followed up for one year and 17 others for five years; in these 22 children there is, of course, still the possibility that difficulties due to their hard deliveries may yet appear. It was in this group that the 1 impaired child appeared, with epilepsy attributed by the neuropsychiatrician to birth injury. Fifteen of the 43 children have been followed up for ten to twenty-six years and all are apparently normal, save 1 who died at the age of ten years of melanosis of the neck. One child, at the age of 1 year, had

partial inability to rotate externally the right lower extremity. The cause of this was indeterminate on examination by the orthopedist who instructed the parents to return with the child if the difficulty persisted. This they have not done.

In summary, 43 children have been followed up for six weeks to twenty-six years with only 1 having gross evidence and 1 having questionable evidence of neurologic or other birth injury.

#### COMMENT

This study has forcefully re-emphasized for us the fact that difficult labor involves the three factors of pelvic capacity, fetal size and uterine dynamics. In other words, this is the old passage, passenger and powers triad that DeLee and others have always stressed. There is often a fourth factor of the soft parts, the resistant cervix or perineum, the vagina and its supports or adipose tissue in the obese, but these factors are harder to exaluate in studying patients' records in retrospect.

While we have come to have the greatest respect and admiration for the pelvimetric prognostications of the roentgenologists and owe a great debt to their services, the roentgenologists readily agree with us as to the incompleteness of their prognosis, owing to the other factors of fetal size and uterine performance. In any event, it is clear that the management of dystocia cannot be statistically carried out by the obstetrician from a swivel chair with the pelvimetry films before him in a view box. He must repeatedly and patiently study the frequency, regularity, and intensity of the uterine contractions and make himself as expert as he can in the most difficult art of estimating the size of the unborn infant. He must perfect himself in the technic of determining rectally or vaginally the station of the presenting part and appreciate by abdominal examination also the degree of engagement or the lack of engagement. Finally, with these facts and by fine judgment and experience, he must settle, before the best time for cesarean section is gone, whether or not it is reasonable to try a delivery through the pelvis. Almost never is

it necessary in modern obstetrics for a woman to lose a baby in order to determine what type of delivery is best for her. To do so twice is almost inexcusable.

Mussey and Hunt, and a decade later, DeVoe and Hunt, studied the subsequent deliveries of women who had lost 1 or more babies from dystocia. Only 1 of 64 such women was unable in subsequent deliveries to have 1 or more normal children and this patient had a severe hypertension resulting in repeated stillbirths or macerated fetuses.

The high incidence of essentially normal pelvises in this series of 86 difficult vaginal deliveries may be questioned. Some of the earlier patients still remain to be subjected to more accurate present-day pelvimetry although it should be mentioned that in many this study has been done. In some, degrees of contraction were detected while in others the normal capacity was confirmed. If the fetal size is excessive, there exists an absolute or relative disproportion even in the normal pelvis. This is aggravated if the uterine contractions are of poor quality. The figures related above show the importance of fetal size as expressed in terms of the weight of the fetus. The weight of the fetus is an admittedly poor method of determining the size and capacity of the fetal head, but it is perhaps the best measurement we have for it today. Our records of fetal weight were complete, and we feel accurate in each case.

Twenty years ago, no one was satisfied with the accuracy of pelvimetry. Possibly within twenty years, we shall have a practical, simple, and accurate type of cephalometry, roentgenologic or otherwise, but nearly everyone—obstetrician and roentgenologist alike—agrees that such is not now available. It would be a most welcome adjunct to the management of dystocia.

After we noted the importance of fetal weight in this study, we reviewed the records of 116 cases of tests of labor, 55 of which were unsuccessful and 61 of which were successful. Among the successful tests there were only 4 infants (6.6 per cent) whose weight exceeded 4,000 gm. and 3 of these 4 cases already had been encountered



*in our group of 86 cases of dystocia!* The fourth patient delivered spontaneously an infant weighing barely more than 4,000 gm. In the 55 unsuccessful tests, there were 16 infants (29.1 per cent) whose weight exceeded 4,000 gm. Thus the incidence of large babies was four and one-half times as high in the group in which tests of labor failed and cesarean section was required as in the group of patients who succeeded in their tests of pelvic delivery.

Obviously, many women with ample pelvises can and do deliver large babies without undue difficulty, but the importance of fetal size looms large in our group of women who required hard forceps deliveries even though the pelvis seemed ample in many instances. When a patient with a large fetus does poorly in labor, cesarean section should be contemplated though the pelvis seems adequate. It matters little whether the pelvis is classed as "normal" if it is too small for a large fetal head or if cephalopelvic disproportion exists. Naturally, such indications will not often arise and the conscience of the physician is involved just as for any other indication for cesarean section.

The fact that exactly half of the patients in this dystocia group had unsatisfactory uterine contractions, which were classified as poor or fair rather than good, speaks for itself as to the importance of this function as one of the triad of dystocia.

When one recalls that the cases were selected because of the difficulty of the delivery, over a period of seventeen years, a high fetal mortality could be expected and did occur. The remote results were extremely encouraging in that only 2 of 43 children who had been followed up for months and years showed any question of neurologic injury. No injury is known among the remaining 31 infants; they were all dismissed from the hospital in satisfactory condition. The population from which our obstetric material comes is a fairly settled one and most of their medical care is received at the clinic; thus it is reasonable to believe that we would have been acquainted with the majority of troubles that

might have arisen in the group of children. Some few instances of difficulty may well have occurred, of course, among infants whose parents moved away or sought care elsewhere.

We conclude, then, that if the infant survives the delivery and the neonatal period, its chances for a normal life are excellent. This most encouraging result was not entirely unexpected, since Keith and Norval are reporting similar results in the independent pediatric study of some of our more recent obstetric material. They show little if any increase in neurologic difficulties in children born after prolonged labor or in infants suffering from asphyxia neonatorum as compared with control groups, although the initial risk was likewise higher from these factors.

The infertility of these patients following their hard deliveries is cause for concern. At present we believe that this is on a voluntary basis. Only 40 per cent, to our knowledge, have since become pregnant. Here, too, the figure of which we have exact knowledge may be lower than the actual figure of subsequent reproduction, but it seems certain that fertility is low when there have been only 45 babies born to these 86 women since their difficult deliveries. Here is a responsibility for the obstetrician. We agree with the attitude of Cosgrove that the woman who has suffered the ordeal of an unusually difficult delivery should virtually be promised that such an experience will not be duplicated. In general, this can be almost universally effected and contrary to some opinions, without an excessive resort to cesarean section. The incidence of cesarean section in our patients who later became pregnant again was 18.2 per cent, which is not a very high figure when one recalls how this group of cases was selected. There was no fetal mortality in the subsequent pregnancies, nor findings of fetal injury. However, probably 3 of the 27 patients delivered from below might have had abdominal delivery, as they involved a repeated midforceps delivery. If such patients are subjected to a test of labor it should not be too rigorous. We sug-

gest that after an especially difficult delivery, the attending physician note his recommendations for the management of subsequent deliveries while salient points of his difficulties are fresh in his memory. These suggestions may not always appear sound later, but will at least warn others who may in the future be responsible for attendance on the woman.

#### CONCLUSIONS

1. Pelvimetry alone, while of great value as a prognostic guide in dystocia, is not enough. The fetal size as measured by its weight is of tremendous importance as is study of the quality of the uterine contractions.

2. The immediate fetal mortality rate in our series of cases was high; the uncorrected rate was 14 per cent, and the corrected rate about 8 per cent. However, the remote results as to the surviving children have been very encouraging. There was no maternal death.

3. The infertility following the type of delivery studied is disconcertingly high. The physician should be able to increase the fertility rate subsequent to severe dystocia by a discussion with the patient and her husband. He should be able to promise that there will be no repetition of a grueling ordeal and yet offer a good fetal prognosis. With care and planning, this promise can almost invariably be kept.

#### DISCUSSION

Dr. E. L. King (New Orleans): First of all, does Dr. Hunt agree with the idea that textbooks should speak more of disproportion, rather than of contracted pelvis? I think that it is important that we should emphasize the question of disproportion. Secondly, does he not agree that the radiologists' reports should give the size of the pelvis and fetal head without expressing an opinion as to whether the baby will get through or not?

Dr. Arthur B. Hunt (Rochester, Minn.): I heartily agree with Dr. King's points. The crux of the matter is summarized in the word, disproportion, and it is rather immaterial whether the pelvis is normal or not if the baby is too large for it.

Secondly, the radiologist probably should report what he sees and let the obstetrician determine the prognosis in labor from the pelvimetry films. One of our radiologists is expert in offering a prognosis, but even so, we care more for his general

opinion about the pelvis and its measurements, exactly because he can not estimate the quality of the pains and determine exactly the size of the fetus.

## SIGNIFICANCE OF THE FETAL HEART RATE IN PREGNANCY AND LABOR

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AND

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NEW ORLEANS

The frequent auscultation of the fetal heart tones is common practice on all obstetrical services. Their significance is not usually appreciated except as a prognostic sign in regard to the status of the fetus. It is our purpose here to discuss the significance of the fetal heart tones, the mechanism by which changes in rate occur, and the management of cases in which these changes in rate and rhythm are present.

#### HISTORICAL DATA

The fetal heart tones were first heard in 1818 by F. I. Mayer, a surgeon from Geneva. In 1821, Lejumeau de Kergardec, an obstetrician and associate of Laennec, also heard the fetal heart tones and uterine souffle; he showed that the maternal pulse had no effect on the fetal heart beat. Naegle, in 1850, found that the fetal heart rate was decreased by compression on the cranium of the baby at the time of its passage through a narrow pelvis. One of the first to advise immediate delivery of a fetus whose heart rate exceeded 160 per minute was Winckel in 1903. In 1925, Bartholomew was one of the first to disagree with this management; he felt that rapid rates were not serious, and moreover, infrequently observed. DeLee in 1915 in collaboration with Hillis, devised the head stethoscope which we use today.

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## NORMAL VARIATIONS

Fetal heart tones are usually first heard at eighteen weeks' gestation, but may be heard as early as fourteen weeks to sixteen weeks. At the onset, the rate is rapid—around 150 per minute and most frequently heard in the midline just above the bladder.

*Clinical significance in early pregnancy.* The presence of fetal heart tones is a definite sign of pregnancy. It is one of the few physiologic phenomena of the fetus which may be observed accurately and at will. It may be clinically significant by its absence along with the finding of an enlarged uterus, indicating such possibilities as: (1) dead fetus, (2) hydatiform mole, (3) multiple pregnancies, (4) uterine tumors, and (5) spurious pregnancy.

*Clinical significance in late pregnancy.* The fetal heart rate has a normal variation in late pregnancy—120 to 170 per minute. The rate may be increased by fetal movements and activity, or manipulations of the fetal head by abdominal palpation. Vaginal or rectal examination may cause either an increase or decrease in rate.

One of the earliest manifestations of fetal distress in the form of anoxia may be a change in the fetal cardiac rate. On the other hand, Sontag and Newberry<sup>1</sup> found that three-fourths of all patients have a fetal heart rate of 160 or over, without evidence of fetal distress, at some time during the last two months of pregnancy.

In the last months of pregnancy although the location of the fetal heart tones will often hint at the position of the baby, this finding is not by any means definite as to presentation or position.

Frequently it may become necessary to differentiate between the maternal pulse rate and the fetal heart rate when the former is rapid. To do so, Berlind<sup>2</sup> has used a technic based on the phenomenon of respiratory arrhythmia. The normal maternal beat is accelerated during inspiration due to the decrease of vagus activity and slowed during expiration because of an increase of vagus activity.

The failure to detect fetal heart tones

does not necessarily indicate the death of the fetus. Such factors as obesity, a loud maternal pulse obscuring the fetal heart beat and polyhydramnios may be present, making auscultation of the fetal heart tones impossible.

## NORMAL VARIATIONS DURING LABOR

During labor, the same variations as noted above in late pregnancy may prevail. In addition, there may be slowing of the rate with uterine contractions or deep sedation. Vasomotor stimulants such as pitocin, or adrenalin (used in saddle block anesthesia) may cause an increase in the rate. If, following spinal anesthesia, there is a temporary drop in maternal blood pressure, changes in fetal heart rate are often observed.

## ABNORMAL VARIATIONS DURING LABOR

1. *Rapid rate:* In a survey of the literature, the impression obtained was that transient fetal tachycardia does not necessarily indicate fetal distress. King<sup>3</sup> states that rates up to 170-180 are no cause for alarm providing the uterine contractions are not unduly strong or too close together. He feels that a rapid rate may mean threatened or early asphyxia. Lund<sup>4</sup> has observed that persistent, marked fetal tachycardia is a fallible sign of fetal distress. He has classified fetal tachycardia as either transient or persistent with a time limit of twenty minutes between the two classes. He lists the etiologic factors in transient fetal tachycardia as follows: (a) fetal movements and activity, (b) application of forceps, (c) pressure of the head on the perineum, (d) uterine contraction, and (e) rectal or vaginal examinations. Lund has concluded from his study that transient, rapid fetal heart rates were neither common nor hazardous and that dangerous and unjustified obstetrical intervention was largely responsible for the unfortunate results commonly and erroneously attributed to fetal tachycardia.

On the other hand, Richardson<sup>5</sup> has pointed out that a rapid rate of the fetal heart may be the earliest indication of abruptio placenta and often occurs before evidence of hemorrhage appears. He offers

the explanation that any separation of the placenta alters the oxygen and carbon dioxide exchange between the placenta and placental site; (slight crescentric separations at the periphery usually do not effect the fetal heart rate). As placental detachment increases, the oxygen-carbon dioxide exchange is altered so as to produce fetal heart embarrassment to which the fetus responds with compensatory acceleration of the fetal heart rate. The fetal circulation speeds up in direct relation to the ever diminishing available area of placental attachment; this continues until the functioning area becomes so small that it is no longer capable of maintaining the oxygen-carbon dioxide balance. There develops an oxygen deficit; carbon dioxide becomes overwhelming; asphyxia occurs, and the fetal heart rate finally slows down.

2. *Slow rate.* This is the sign of most importance and usually is more grave in significance than a rapid rate. It generally indicates fetal distress when persistent. Some interference with fetal circulation is strongly suggested such as a short cord, a true knot in the cord, a cord around the neck with some tension, or a prolapse of the cord. It must be pointed out that the same conditions that cause a rapid rate may also produce bradycardia.

3. *Irregular heart rate.* King<sup>3</sup> states that the significance of this sign is dependent on the relation of the irregularity to uterine contractions. When noted during contractions, an irregular rate is not significant. If the irregularity lasts for one-third to one-half of the interval between contractions, it generally indicates a coil of cord around the neck with some tension. If the irregularity persists throughout the entire interval between contractions, the baby is in serious danger.

#### PHYSIOLOGY

The fetal heart rate is influenced by (a) vagus nerve stimulation, (b) the amount of work the heart has to do in transmitting a varying column of blood, and (c) the oxygen-carbon dioxide content of the blood<sup>6</sup>. Anoxia affects the fetus quickly. Clinically, this may be detected by changes in the rate

of the fetal heart. The rate first increases, then slows down. The slowing may be due to stimulation of the vagus center by anoxemia, an increase in the carbon dioxide content of the blood by metabolic products of asphyxiation, or by compression of the brain. Continued stimulation of the vagus center results finally in its paralysis, and the pulse increases because of the lack of vagal inhibitory action.<sup>7</sup> Therefore, any condition which interferes with the oxygen carrying system of the fetus or which causes stimulation of the vagus impulses will be manifest by a change in the fetal heart rate. If these conditions are transient, fetal asphyxia will not be a problem. If, on the other hand, they persist, the result will be distress of the fetus. This can be relieved only by removal of the cause or delivery of the fetus.

#### MANAGEMENT

In no case should operative delivery by the vaginal route be attempted unless the accepted conditions for such a procedure are present.

*Management in the first stage of labor, delivery not feasible:* If the heart tones indicate progressive fetal distress, cesarean section should be seriously considered. Additional factors may be present to support the choice for this procedure, such as an elderly primipara, cephalopelvic disproportion, or a rigid cervix. The use of oxytoxics should be restricted. Uterine irritability should be treated with sedatives or anesthesia, if necessary. If there is evidence of fetal oxygen lack, sedation should be restricted. The maternal fluid balance should at all times be maintained. Oxygen, given to the mother in the presence of a slow fetal heart rate as a result of fetal oxygen lack, will increase the rate. These cases should be watched carefully with frequent auscultation of the fetal heart tones; the patient should be examined carefully for an occult or true prolapse of the cord. Abruptio placenta should be ruled out.

*Management late in the first stage, delivery feasible:* One of two procedures may be chosen. Immediate delivery may be accomplished either by Dührssen's incisions,



if the cervix is not completely dilated and fails to dilate rapidly; or the patient can be urged to use her contractions if the conditions are such that this will produce delivery in a short period of time. Oxygen should be administered until anesthesia is started. Saddle block anesthesia should not be used here.

*Management in the second stage, delivery feasible:* Immediate delivery by the least traumatic means should be carried out. In a multipara in whom there is no cephalopelvic disproportion and the head is still high, above a safe plane for forceps, version and extraction is indicated. In breech presentation, immediate extraction should be done.

In any case in which delivery is done for fetal distress, prepare for prompt and efficient resuscitation.

#### CONCLUSIONS

1. Fetal heart tones are an important diagnostic sign in early pregnancy.

2. In late pregnancy and during labor, a fetal heart rate over 170 does not necessarily indicate fetal distress, but may be the earliest sign of abruption placenta.

3. A fetal heart rate below 100 is usually indicative of fetal distress. It is very unwise to wait for the rate to drop to 100 before interfering.

4. Close observation and general supportive measures are necessary when the fetus is in distress.

5. In no case should operative vaginal delivery be carried out unless the accepted conditions for such procedures are present.

6. Prepare for prompt and efficient resuscitation of the infant in those patients for whom delivery is done for fetal distress.

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## THE IMPORTANT COMPLICATIONS OF CATARACT SURGERY

(EXCLUSIVE OF SYMPATHETIC OPHTHALMIA)

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NEW ORLEANS

Spaeth<sup>1</sup> was very near the truth when he said that the complications possible after cataract extraction are greater numerically than those which can follow any other type of surgery, regardless of the anatomic area in which the operation is performed. He might properly have gone further. He might have emphasized the small distance which lies between success and failure in cataract extraction and might have pointed out how often an apparently trivial act or circumstance could turn the scale against the patient. Cataract extraction is not a procedure in which life or death hangs on the outcome. On the other hand, when one considers the social, financial, emotional, and psychic consequences which may follow failure, it behooves the ophthalmic surgeon to omit no single precaution which might contribute to a successful outcome.

While I do not intend to discuss the complications of cataract surgery in relation to special techniques, it might be well to mention the interesting studies on senile cataract published from the Wilmer Institute by Hughes and Owens,<sup>2</sup> one of which has to do with the relation of techniques to results.

In the 2,086 cataract extractions performed between 1925 and 1945, which make up this series, five techniques were employed. Loss of vitreous occurred most often in combined intracapsular extractions and least often in round-pupil intracapsular extractions. The incidence of prolapse of the iris was greatly reduced when corneoscleral sutures were employed, as was the number of cases of delayed wound healing. Anterior chamber hemorrhages occurred most frequently after combined intracapsular extractions performed with conjunctival sutures and least frequently after round-pupil

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intracapsular extractions performed with two corneoscleral sutures. Detachment of the retina was somewhat more frequent when intracapsular extractions were performed with conjunctival sutures. Postoperative iridocyclitis decreased markedly in incidence when total extraction of the lens was practised, and secondary glaucoma became less frequent when intracapsular extraction was performed with corneoscleral sutures. In general, my own results are in agreement with these.

Perhaps the most significant thing about Hughes and Owens' report is their statement that over the nineteen year period, which it covers, the incidence of postoperative complications has become progressively lower while final visual results have become progressively better. The development of new techniques has unquestionably played a large part in that improvement, as has the introduction of chemotherapeutic and antibiotic agents. Even more important, however, has been the general refinement of ophthalmic techniques as distinguished from the introduction of new operative procedures—and the ophthalmic surgeon's increasingly broad concept of his specialty. The improvement which Hughes and Owens report, with the passage of years, is a universal experience. It is particularly striking, as would be expected, in such an organization as the Wilmer Clinic, but it is notable elsewhere, in other organizations and in the experience of individual practitioners.

#### ACCIDENTS AT OPERATION

The complications of cataract surgery begin on the operating table, though at this time they might more properly be called accidents, or, in some unfortunate instances, catastrophes. On most of them I shall spend no great amount of time, but they are worth discussing briefly, for some of them can be prevented and others, if they cannot be prevented, can be controlled, or at least minimized, when they have occurred. Prolapse of the iris, and intraocular hemorrhage, which may occur both at and after operation, as a matter of con-

venience are discussed under postoperative complications.

*Movement of the eye* before the completion of section may jerk the knife out of the eye or may cause the section of the cornea to be completed at a more or less oblique angle. In the former event, if no damage has occurred, a conjunctival flap is prepared and the section is completed by means of sharp scissors with blunt tips. If the incision has been completed at an undesirable angle, nothing can be done except to proceed with the operation; sometimes it may be wise to use a sliding flap over the corneal incision.

If *orbicularis spasm* occurs, it must be relaxed as promptly as possible because it predisposes to vitreous prolapse. The patient is told exactly what has occurred, without, of course, alarming him, and is instructed to open the opposite eye. Meantime, while the pull on the affected lid is slightly relaxed, the eyebrow is lifted and is immobilized with digital pressure at the rim of the bony orbit. This simple maneuver usually controls the action of the occipitofrontalis muscle.

*Expulsive extrusion of the lens*, or dislocation of the lens, may occur as the corneal section is accomplished and is occasionally so precipitate that the lens actually shoots from the eye. This is an extremely serious accident because the amount of vitreous lost at the same time is usually so great that phthisis bulbi is almost inevitable, even if immediate subretinal or choroidal hemorrhage does not follow.

*Rupture of the capsule* during delivery makes complete removal of the lens material more difficult. It is essential that this material be removed, for it predisposes to postoperative uveitis, as well as to glaucoma and may require such secondary procedures as discission or capsulectomy, which are not simple operations. When the capsule ruptures, the method of extraction depends upon the position of the lens when the accident happens. These are matters of technique, which I shall not take time to discuss except for the warning that if there is any pressure on the eye, with the asso-



ciated possibility of vitreous loss, the residual capsule had best be left alone after the lens material has been removed.

In the occasional case, especially when the lens is hypermature, it will be found that the moderate trauma associated with corneal section has resulted in *rupture of the zonula*, though the vitreous remains intact. It is sometimes possible to extract the lens with a smooth capsule forceps under these circumstances, but more often the loop must be used. If the vitreous presents before the extraction has begun, one has no choice but to use the loop, since in such cases the hyaloid membrane has ruptured as well as the zonula.

If *fragmentation of the nucleus* occurs during operation, each individual fragment must be removed with smooth forceps or by irrigation. Retention of the nucleus and of any great amount of cortex is highly dangerous, because it may lead, as will be pointed out later, to serious iridocyclitis or ophthalmitis phaco-anaphalactogenica, which may be followed by the loss of the eye. If the case is also complicated by presentation of the vitreous, removal of the nucleus and cortex furnishes real problems, since every manipulation increases the loss of vitreous.

The *loss of vitreous* which is strictly fluid (that is, unformed) is not a matter of any consequence if it is not excessive, since the anterior chamber will re-form as soon as the lens is delivered. The loss of formed vitreous, however, will inevitably occur if more than a certain amount of fluid vitreous is lost. It is particularly distressing when it occurs after the cataract has been extracted and the essential part of the operation is over. Loss of any significant amount causes vitreous opacities, renders the preservation of a round pupil impossible, and predisposes to the development of inflammation, glaucoma, late detachment of the retina, and haziness of the cornea.

When prolapse of formed vitreous occurs, the bridle sutures are immediately released and the patient is told to look upward, or, if anesthesia does not permit his cooperation, the upper lid is lifted away from the

eyeball, the lid elevator is removed and the lids are closed. After a minute or two, the lid elevator is again introduced and the conjunctival sutures are tied with the eyeball in upward rotation. The eyeball is then depressed sufficiently to permit the introduction of the iris spatula and the vitreous which lies between the wound edges is resected. Operative maneuvers must be completed as promptly as possible. As Spaeth<sup>1</sup> says, attention to this simple detail has probably saved more eyes than any number of fussy, complex manipulations.

Loss of vitreous seldom occurs if there is no pressure on the eye. Pressure can be prevented, as Guyton<sup>3</sup> points out, by akinesia of the orbicularis and the extraocular muscles, an adequate palpebral fissure, secured by canthotomy if necessary, and lack of excessive retrobulbar bulk. General anesthesia should be used in patients who present the latter finding, or in whom there is excessive intraorbital resistance, since retrobulbar injection will aggravate the situation.

#### POSTOPERATIVE COMPLICATIONS

*Prolapse of the Iris.* Prolapse (or retroversion) of the iris which occurs at operation, before extraction, is usually impossible to correct. Peripheral iridotomy sometimes takes care of the situation, but as a rule complete iridectomy is necessary.

Partial or complete iridodialysis may occur in the course of iridectomy, either because the patient moves his eye while the iris is in the grasp of the forceps, or because the surgeon removes the forceps with the iris in its grasp, without completely sectioning it with iridectomy scissors. If iridodialysis is partial, as is likely, it may be possible to stroke the iris back into the angle in such a manner that the complication will not be apparent after healing has occurred. If iridodialysis is complete, the only possible remedy is pinhole glasses.

Perhaps the most common cause of postoperative prolapse of the iris is difficulty in repositing the iris at operation, because of bulging of vitreous into the wound. Loss of vitreous, however, is not a predisposing factor. The incidence of prolapse of the

iris has been greatly reduced by the use of corneoscleral sutures, and when this technique is employed, it is doubtful that the preservation of a round pupil predisposes to the accident.

Postoperative prolapse of the iris is usually seen at the first dressing. Sometimes it is barely visible. Sometimes it is slight and is well covered with conjunctiva. Sometimes it increases in size from day to day. It may be associated with aqueous filtration.

It is not always necessary to repair a slight prolapse of the iris, and the displacement is not necessarily inconsistent with good visual acuity. In small prolapses intensive use of miotics may prevent further herniation into the wound and permit satisfactory healing. Hughes and Owens,<sup>2</sup> in fact, found no difference in the final visual results between cases in which small covered prolapses were let alone and those in which various surgical procedures were carried out, such as complete excision, closure with a conjunctival flap, and closure with a corneal suture. Whether operation was immediate or delayed also made no difference in their results. Allen,<sup>4</sup> on the other hand, makes a point of delaying for a week or more in prolapse which occurs later than forty-eight hours after operation, so that the wound may be as firmly healed as possible.

Spaeth<sup>1</sup> advocates a single application of the actual cautery but opposes more than one application, as inviting sympathetic ophthalmia. If the first application is unsuccessful, his preference is for surgical correction of the prolapse by resection and the van Line sliding flap.

When there is a wide gaping, corneoscleral sutures are usually essential to provide adequate protection to the contents of the eye from the outer world. Allen<sup>4</sup> very properly suggests that the surgeon who must operate for a prolapse of the iris should spend some time thinking about what he is going to do before he does anything. The tissues, he reminds his readers, are thin, and undue haste or pressure may cause disastrous loss of vitreous. He sug-

gests thorough anesthesia by the retrobulbar, subconjunctival and topical routes, with enough adrenalin to reduce tension and soften the eyeball (if it is not already soft) so that vitreous will not present as soon as the incision is made. Canthotomy and cyclodialysis after excision of the prolapse are added precautions. My own preference in prolapse of the iris is to take the patient back to the operating room promptly, replace the iris under pentothal anesthesia, and close the wound with another corneoscleral suture. The eyes look and function better, in my experience, when this plan is used, and the postoperative course is smoother.

*Hemorrhage.* Moderate bleeding at operation, which usually occurs before delivery of the lens, may come from the incision, or from a small iridodialysis. It should be checked and the anterior chamber cleared of blood before the lens is delivered. This type of hemorrhage is seldom a serious complication.

The expulsive type of bleeding, which sometimes occurs at operation, usually follows loss of vitreous. It is not necessarily associated with hypertension, which suggests that preoperative attempts to reduce a high blood pressure are uncalled for. It is, however, related to age; it is sometimes associated with choroidal arteriosclerosis, and it may follow sudden reduction of intraocular tension, particularly in glaucoma. Most surgeons feel that when it occurs, the prognosis is hopeless and the only problem is whether to do an evisceration at once or at a later time. If the anesthesia is such that the patient is oriented, it is possible to obtain his permission to proceed at once. Lindner<sup>5</sup> is almost alone in believing that some eyes can be saved. His method is to make two trephining holes immediately, with a 2 mm. trephine, each 10 mm. from the limbus. He uses cocaine (0.2 cc. of a 3 per cent solution) for anesthesia and also institutes intravenous calcium therapy at once.

Expulsive hemorrhage which occurs after operation begins with violent pain, followed by chills and fever. The wound ruptures.



and blood pouring from it carries with it the vitreous and the retina. Impending subchoroidal hemorrhage, if it can be anticipated, can sometimes be averted by immediate posterior sclerotomy, which permits drainage of the subchoroidal and subretinal spaces, but usually the damage is done before treatment is possible.

Hemorrhage into the anterior chamber and hemorrhage through the vitreous which appear in the coloboma of an iridectomy are treated by firm pressure dressings, morphine, and hemostatics, including thromboplastin, subcutaneously or by vein. Absolute rest is essential.

Hemorrhage into the anterior chamber following operation usually absorbs fairly promptly, but the hyphemia, which develops later, for some reason does not, particularly if the patient is a diabetic. Trauma is always a precipitating factor, but the accident may occur following routine atraumatic dressing of the wound. The initiating pain may last three to six hours. In many instances blood cells are precipitated to the lower levels of the anterior chamber with the result that the iris has a brassy look, while blood cells and blood pigment lie in grooves and folds on Descemet's membrane. An important result of late hyphemia is that the fibrin present may result in an organized exudate which bridges the pupil. Treatment consists of mydriatics, dionin to promote absorption, calcium, iodides, thromboplastin, and warm compresses.

I mention with some hesitation a dehydration regimen which I have employed with considerable success in intraocular hemorrhage over a period of years. It consists of (1) the withholding of all food and fluid, (2) the intravenous infusion of 50 cc. of 50 per cent glucose, (3) the subsequent administration of white Karo syrup in fruit juice or water every three hours during the day and every four hours during the night,

and (4) the twice daily administration of ascorbic acid. Although the rationale of this method would be difficult to justify, there is no doubt in my own mind that by this means I have saved the sight of more than one patient with intraocular hemorrhage.

There might also be mentioned in this connection the report by the Eye Bank for Sight Restoration Incorporated, of several cases in which vision has been improved by intraocular injection of a small amount of the patient's own spinal fluid, which, it will be remembered, has much the same chemical make-up as vitreous humor. The blood-stained vitreous is removed through a hypodermic needle of large caliber, with a hypodermic syringe used to create negative pressure.

*Delayed Re-Formation of the Anterior Chamber.* At the first dressing, forty-eight hours after operation, the anterior chamber is usually found re-formed and of normal depth. Sometimes, however, it is collapsed at this time, while in other cases in which it has re-formed normally, it may subsequently be lost. In still other cases it may collapse when the corneoscleral sutures are removed, or immediately after their removal.

If the sphincter is intact, re-formation of the anterior chamber which is delayed beyond the fifth or sixth day is a potentially serious complication, although Zentmayer<sup>6</sup> reported a case in which re-formation was delayed until the eighteenth day without bad results. This is, however, most unusual. The most constant etiologic factor in delayed re-formation and late loss of the anterior chamber is a leaking wound, with filtration of aqueous through the corneal incision. Restlessness, coughing, squeezing of the lids and similar actions are precipitating causes, as are technical errors at operation. Frequently there is direct clinical evidence of the aqueous filtra-

tion, in the form of gaping of the corneal incision, a filtering bleb of conjunctiva, or a tear in the corneal flap. The fluorescein test is frequently useful in demonstrating these findings. Three serious complications may ensue: (1) formation of peripheral synechiae at the angle of the iris, as the result of contact between the cornea and the iris, with a subsequent predisposition to secondary glaucoma; (2) epithelization of the anterior chamber, and (3) striate keratitis, which persists as long as the iris and cornea remain in contact with each other.

Every endeavor should be made to keep the pupil mobile and thus prevent peripheral anterior synechiae. Mild mydriatics are used occasionally but for the most part it is kept constricted with miotics. Air may be injected into the anterior chamber, through a slanting incision on the cornea, though this method should be used with the greatest care, as it may cause the breakdown of the healing incision; it may be wiser to cover the incision with a conjunctival flap before it is employed. Silver nitrate may be used along the edge of a leaking wound, or, if this fails, a small leak may be sealed with diathermy. If a definite fistula is found, it should be opened at once; capsule, iris, or whatever structure is incarcerated in it should be removed, and the opening should be lightly cauterized and closed with a conjunctival flap.

*Detachment of the Retina and Choroid.* The incidence of retinal separation after cataract extraction, according to Hughes and Owens,<sup>2</sup> is as frequent after the extracapsular as after the intracapsular type of extraction, which suggests that the supporting action of the posterior capsule-zonule diaphragm is not as important as it is sometimes supposed to be. In their series the incidence rose in proportion to the amount of vitreous lost, which I think is the general experience. Bagley's<sup>7</sup> studies suggest that the loss of vitreous may initiate degenerative changes, with the formation of traction bands, which subsequently pull off the retina. My own experience proves the logic of this reasoning.

Separation of the retina is likely to develop in cases in which the postoperative course has been stormy. It is particularly likely to follow loss of vitreous. On the other hand, the patient's history and the appearance of the affected eye frequently suggest that the condition may have existed prior to operation. Delayed discovery of the accident militates against successful re-attachment. Any detachment, in fact, which has lasted longer than two months is not usually reparable. Diathermy is fairly successful in bringing about re-attachment. According to Guyton,<sup>3</sup> a single application is successful in about 30 per cent of all cases and two applications are successful in another 30 per cent. If, after evacuation of subretinal fluid, the retina does not fall back into position promptly, the injection of isotonic solution of sodium chloride into the vitreous or the anterior chamber may force it back into place.

Detachment of the choroid immediately after a cataract operation has no great clinical significance. Some ophthalmic surgeons believe that it will be found routinely if it is looked for. It may affect any portion of the retina and may be so extensive that, as Spaeth<sup>1</sup> describes it, examination of the fundus reveals nothing but a gun-barrel-like tube directed toward the posterior pole of the eye. Holloway and De-Long,<sup>4</sup> by careful correlation of ophthalmoscopic findings and microscopic sections, showed that in most cases the condition is the result of massive choroidal and subretinal edema, following capillary transudation of serum. The circumstances of its development and the slow but consistent spontaneous recovery which usually follows are in line with this conjecture.

It was formerly the practice to restrict activity in postoperative choroidal detachment, but at the present time most ophthalmic surgeons permit the usual postoperative regimen, with perhaps a little more activity than normal, and are securing as good, if not better, results.

Prolonged choroidal detachment, with the loss or flattening of the anterior chamber which always accompanies this compli-



cation, is, of course, a serious matter, since it is likely to result in the formation of anterior synechiae between the iris and cornea, frequently with subsequent secondary glaucoma. My own plan, if I am confronted with a shallow anterior chamber and if the fluorescein test reveals no leak in the wound, is to search for a choroidal detachment, which is usually found. Treatment is begun at once with eserine salicylate (0.5 per cent) three times daily. This constricts the pupil and pulls the iris root out of an already embarrassed iris angle. My experience is that re-formation of the anterior chamber and absorption of the subchoroidal fluid usually occurs. If the desired results are not secured by this method, as of course they are not in all cases, I observe the patient for a few days longer. If at the end of a week the anterior chamber is still flat, the patient is taken to the operating room, the sclera is exposed over the detachment, a Graefe knife is slipped through the sclera, care being taken to avoid the region of the vortex veins, and the wound is held open with a Worth muscle hook until most of the subchoroidal fluid escapes. The anterior chamber often re-forms before one's eyes. If it does not, air injection is carried out.

*Delayed Wound Closure.* Delayed or incomplete closure of the wound through which a cataract has been removed is not uncommon. Satisfactory healing should be complete by the seventh postoperative day. Delayed healing is much less frequent since the corneoscleral or some other type of suture has been used to close cataract incisions.

If healing is delayed after capsulotomy, some capsular remnants have probably been caught in the wound. Protrusion of the vitreous may also be responsible. One method of making certain that this does not occur is to sweep the iris spatula the full length of the wound just before the lids are closed. If either of these conditions is responsible, it should be corrected, by cauterization, additional corneal sutures, or conjunctival flaps, according to the necessities of the individual case.

*Wound Rupture.* Late rupture of a cor-

neoscleral wound, if not caused by expulsive hemorrhage, is almost always the result of trauma. Whether or not prolapse of the iris has occurred, the ruptured portion of the wound should be uncovered and the edges should be sutured to the episcleral tissues with fine silk sutures, which then are covered with a conjunctival flap. If rupture has been extensive, the wound margins should be lightly cauterized with the actual cautery before the sutures are tied. If prolapsed iris or vitreous is present, it must be cleanly resected. Failure to care for prolapse of the iris may result in high limbal staphyloma, and extensive secondary surgery may be necessary to save the eye and prevent inevitable secondary glaucoma.

*Complications Arising from Removal of Sutures.* Complications are not infrequent following the removal of sutures from a corneoscleral incision, though some of them can be avoided if the sutures are properly placed, that is, if long superficial bites are taken into the sclera and the corneal lips of a somewhat shelving notch.

As a rule, sutures should not be removed before the tenth day. Adequate topical anesthesia, sometimes supplemented by akinesia of the lids, may be necessary in patients who have developed photophobia and sensitivity and in whom manipulations without this precaution would be difficult or impossible. The sutures should not be grasped with forceps before they are cut. The upper lid should be lifted with the finger and the point of a sharp Stevens scissors should be introduced from below, or horizontally, into the loop of suture, which then can be cut with safety. The aid of a loupe magnifier is essential, as is good illumination. When this method is used, if the patient moves suddenly, or is uncooperative, no harm is done; the loop of suture is merely pulled away from the point of the scissors. If difficulty is encountered when an attempt is made to remove sutures at the usual time, there is no reason why their removal should not be delayed for another week or two.

*Filtering Cystoid Cicatrix.* Filtering cystoid cicatrix occasionally follows capsul-

otomy extractions. Examination with the slit lamp usually shows a minimal incarceration of the iris, at the mid point of the incision lying over the mid point of the coloboma. In such cases healing has occurred with the lips of the sclera slightly offset from each other. The patient is treated as if he had had an operation for filtering cicatrix and is carefully guarded against infection, to which this condition makes him peculiarly susceptible.

*Conjunctivitis.* Conjunctivitis and other intraocular infections are fortunately not common in modern ophthalmic surgery. One reason is that great care is taken before operation to be certain that pyogenic bacteria are not present. This precaution is essential, since the closure of the eye after operation provides a satisfactory culture tube for any retained bacteria, the growth of which is also favored by the body temperature, the lack or movement of the parts, and decreased tear secretion.

Any infection confined to the conjunctiva, if properly treated, usually clears up satisfactorily, though it may prolong convalescence for many weeks. Spread into the anterior chamber must be prevented. General measures include (1) the use of hot sterile compresses, (2) copious irrigations with warm boric acid or warm normal saline solution often enough to keep the cul-de-sac free from pus, (3) the local and systemic use of sulfamylon (1 per cent), and (4) the local and systemic use of penicillin or streptomycin or both. These agents have largely replaced those formerly employed, such as silver nitrate, argyrol, and mercury. In conjunctivitis, as in other infections following cataract extractions, it is of the greatest importance (1) that the antibiotic drug be given in sufficiently high dosages to accomplish adequate blood levels, and (2) that its administration be continued for a sufficiently long period, so that, when it is withdrawn, reactivation of the infection does not occur.

Atropine conjunctivitis, which is not peculiar to cataract extractions, is treated as it would be under other circumstances, that is, by withdrawal of the drug, the substitu-

tion of some other mydriatic, the local use of boric acid ointment, and frequent irrigations of the cul-de-sac with warm physiologic salt solution. If it is particularly desirable that atropine be continued, this is frequently possible if 1 or 2 drops of benadryl ( $\frac{1}{4}$  per cent) or antistine drops are added to the solution and some one of the antihistaminic drugs is given orally.

*Iridocyclitis.* Iridocyclitis following cataract extraction has three chief causes:

1. It may be the result of leaving lens capsule and cortex in the eye at operation. This type of infection is for all practical purposes allergic and the picture is non-specific. If tests for sensitization prove positive, treatment consists of desensitization by a lens protein staphylococcus toxin mixture, by the method devised by Burky and Henton.<sup>9</sup> Removal of the lens material left *in situ* is not advised. Its absorption is preferable.

2. Iridocyclitis may follow rupture of the hyaloid membrane of the vitreous at operation or, in some cases, at a considerable length of time after operation. It is usually a late complication, after round pupil intracapsular extraction, when it may be explained by the blocking off of the pupil with a bleb of vitreous which frequently projects forward like a mushroom into the anterior chamber.

3. The third type of iridocyclitis is a low grade and extremely obstinate infection. Chemotherapy and antibiotic therapy are ineffective and the best results are secured by typhoid vaccination combined with mydriatics and hot compresses. Short wave diathermy has also been advised.

Spaeth<sup>1</sup> suggests that iridocyclitis is sometimes the result of activation of a latent tuberculous lesion by the trauma of operation. If such an origin is suspected, an intradermal tuberculin test should be carried out, with appropriate treatment if it is positive. Only in the occasional case does iridocyclitis go on to sympathetic ophthalmia.

*Spastic Entropion.* Spastic entropion occurs only when conjunctivitis, or iritis, or iridocyclitis is present. It may continue, in



spite of efforts to control it, until the etiologic factors are corrected. If the application of slightly diverging strips of adhesive to hold the lower lid downward is not successful, external angle canthotomy should be performed without delay, since the condition causes too much irritation to permit it to continue unchecked.

*Purulent Endophthalmitis.* Though purulent endophthalmitis may develop weeks or even months after operation, it is usually observed at the first dressing. In most violent cases the pathologic changes include edema of the lids, edema and congestion of the conjunctiva, haziness of the cornea, exudate in the anterior chamber, and blurred red reflex. There are several possible causes, such as (1) a low grade chronic dacryocystitis following obstruction of the lacrimal ducts; (2) inadequately treated chronic conjunctivitis; (3) an acute upper respiratory tract infection; (4) superficial abscesses around the corneoscleral sutures, occasionally with direct extension of infection along the suture tract into the anterior chamber; and (5) a break in sterile technique.

Prophylactic measures include (1) careful examination of the lid margins, conjunctiva and lacrimal sac before operation, to exclude chronic infection and (2) the preoperative local use of penicillin, even in grossly clean cases, at least three times in the twenty-four hours preceding operation. Naturally, if any infection is present, operation is postponed until it is cleared up by appropriate measures, which always include penicillin. Special precautions are taken at operation to ensure absolute sterility.

The treatment of a postoperative infection is chiefly the administration of penicillin in adequate intraocular levels. Mydriatics are used to keep the pupil as well dilated as possible, and foreign protein therapy is given in the form of injections of milk or of typhoid or diphtheria antitoxin. Results are none too good with this method from the standpoint of visual acuity, and enucleation or evisceration may eventually be necessary, but in the prechemothera-

peutic era the outlook was practically always hopeless. Spaeth<sup>1</sup> believes that if the infection is limited to the anterior segment, discission or iridotomy of organized exudate may save some eyes. He has also observed an occasional recovery following spontaneous perforation of the cornea.

*Corneal Changes.* The importance of prolapse of the iris and vitreous is not only the low grade iritis, which usually recedes, but the slow, progressive haziness of the cornea which may follow at an interval of some months and which is frequently responsible for serious loss of vision. Other causes of persistent corneal haziness (striate keratitis), in addition to postoperative iridocyclitis, include excessive instrumentation at operation, traumatic placing of sutures, and careless wound closure. Any of these causes may be responsible for such a degree of damage to the corneal epithelium that normal regeneration is prevented and edema persists.

In Hughes and Owens',<sup>2</sup> experience, persistent haziness of the cornea was more frequent after intracapsular extraction with corneoscleral sutures than after extracapsular extraction without them. To reduce its incidence they suggest the use of very fine braided silk on atraumatic needles. Care should be taken not to tie the sutures too tightly if the suture tract is unusually long. The use of a surgeon's knot is also wise, but not essential.

Nutritional changes following cataract extraction are most likely to follow a previous uveitis. The cornea becomes dull and infiltrated and the blotchy deposits on the posterior surface are quite different from the punctate keratitis present in the usual iridocyclitis. The iris becomes dull, and organized exudates bridge the pupil. Frequently considerable uveal pigment is present. Cultures are consistently negative, but the treatment is the same as that employed for frank infection. Results are slow to appear.

*Epithelial Downgrowth.* Downgrowth of the epithelium into the anterior chamber may be the cause of intractable secondary glaucoma following cataract extraction.

The complication can be avoided by the use of corneoscleral sutures, to insure firm closure, with careful inspection of the closed wound with magnification (my personal preference is for the 2½ power telescopic loupe) after the sutures are tied and before they are cut. The long ends, which are used for retraction purposes, make possible careful inspection of the wound for tags of conjunctiva or cornea. If any are present they can be massaged out of the wound with the curved back of a small Worth muscle hook. Those longer than 1.5 mm. should be picked up and cut off. Irradiation has been employed in the management of this complication, but neither it nor any method is effective if epithelization of the anterior chamber is extensive.

Epithelial cysts of the anterior chamber are most likely to be found in cases in which there has been delayed wound closure, as the result of early invagination of epithelium. They are difficult to treat. Needle evacuation of the fluid, followed by irrigation with weak iodine solution, is sometimes successful, as is the injection of sclerosing fluids into the cavity. Irradiation has yet to be established as an effective method.

*Secondary Glaucoma.* In the occasional case, ocular hypertension discovered after cataract operation may be pre-existent. It is quite possible for low grades of simple, primary, noninflammatory glaucoma to exist without detection. If it is detected, it should be treated before cataract surgery is done.

Most often glaucoma discovered after a cataract operation is related to the operation. The most common cause is iridocyclitis, though it may also follow (1) failure of the anterior chamber to re-form, (2) retention of capsular and cortical fragments, (3) loss of vitreous, and (4) downgrowth of epithelium into the anterior chamber.

In some cases of secondary glaucoma miotics are effective, but as a rule surgery is required. If the angle is blocked by anterior synechiae of inflammatory debris, cyclodialysis is the procedure of choice, though some surgeons prefer corneoscleral trephining. No surgery can be performed

until any inflammatory reaction which may be present is well controlled. In the interim, the glaucomatous condition is treated by bed rest, sedation, miotics, and, if necessary, paracentesis of the anterior chamber.

*After-Cataract.* The essential factor in the formation of an after-cataract is the persistence in the pupillary aperture of sheets and strands of anterior capsule. The remnants of the cortex and of hemorrhage may also be present. Retained cortex may play some part in the development of the after-cataract, though many authorities feel that in the absence of infection, iritis is unlikely to develop unless the lens is hypermature or is otherwise degenerated.

Various prophylactic measures have been suggested, including the use of special forceps and irrigation of the aqueous chamber. Treatment consists of discission with a sharp knife needle of the Ziegler or Wheeler type, capsulotomy, iridocapsulotomy discission with a deWecker scissors, or capsulectomy. All of these corrective procedures may themselves be attended by serious complications. Discission, for instance, may be followed by secondary glaucomatous iridocyclitis, with later phthisis bulbi, and by late retinal separation, as the result of vitreous contraction; both are usually delayed complications. If synechiae have formed, capsulectomy is contraindicated, since, if they are dense or multiple, the trauma of operation may precipitate iridocyclitis or cyclitis.

#### THE GENERAL STATE OF THE PATIENT

Because cataracts are chiefly found in elderly persons, surgery is attended with certain risks not commonly present in younger patients submitted to operations on the eye. The strict immobility formerly required was sometimes difficult to impose and often predisposed to hypostatic pneumonia, which might have serious consequences, as well as to thrombosis and embolism. The introduction of corneoscleral sutures has made this regimen no longer necessary. A patient operated on under local anesthesia may be placed on a low back rest immediately, and all patients, if it seems desirable, can be got out of bed



within six to twenty-four hours after operation. The patient must be told, however, that he must avoid abrupt, jerky, and jarring movements.

Foci of infection everywhere in the body, including the teeth, nose and ears, chest, and prostate gland, should be identified and properly treated before operation. Although there is not complete agreement on this point, there is no doubt that iridocyclitis may be of endogenous origin, and many authorities hold that it is more frequent after operations on patients with foci of infection.

There seems no special relationship between hypertension and the development of such postoperative complications as expulsive choroidal hemorrhages, and therefore no reason to delay operation in an attempt to reduce it. Syphilis also seems to play no part in postoperative complications. Certain complications, however, are thought to be more frequent in diabetic than in non-diabetic subjects, on the general principle that diabetics are particularly susceptible to trauma. Actually, complications in diabetic subjects are prone to occur only in those on a high insulin dosage. These complications, which chiefly take the form of an increased frequency of anterior chamber hemorrhages, are readily explained by the sclerotic condition of the peripheral circulation in diabetes. Satisfactory stabilization of the diabetic state is essential both before and after operation and calls for the services of a competent internist.

Postoperative delirium or psychosis is particularly frequent in elderly subjects. It may range from the simple mental confusion of senility to hallucinatory insanity. It is essential that patients who are used to alcohol receive it regularly, to prevent withdrawal delirium. Greenwood,<sup>10</sup> who estimates that postoperative delirium occurs in 2 to 3 per cent of all cataract extractions, observed no increase in the frequency of this complication in the large number of insane persons upon whom he had operated. This situation he attributes to the prophylactic use of large doses of barbiturates. There is no doubt that chloral hydrate, the

bromides and similar agents are effective in preventing postoperative delirium, but they are of no value when it is once established. Moreover, when such drugs are employed in elderly subjects, they should be used in small doses, and with frequent changes of position, to prevent respiratory complications.

The importance of delirium after cataract extraction is not the condition per se, but the damage which the patient may do to the operated eye in the course of it. The reassurance of an understanding member of the family or of a friend is often of far more value than any medical treatment. Incidentally, much nervousness and apprehension at operation and afterward can be prevented by explaining to the patient beforehand exactly what is to be done, what he must do to cooperate, and what can be expected in terms of improvement of vision if the operation is a success.

Postoperative precautions against the development of complications after cataract extractions are so well known that they need only be mentioned. Straining to empty the bowel or the bladder must be avoided, and the patient may usually be permitted to get out of bed to perform these functions if that proves necessary. Coughing must be prevented by sedation, since it may cause expulsive subretinal hemorrhage and similar complications. Sneezing should also be prevented and nothing should be used at the time of dressings which would be likely to cause it. Postoperative vomiting is not infrequent, even when local analgesia has been used, and methods to prevent it must be used.

#### SUMMARY

Certain of the most important complications which may occur in the course of cataract operations, or which may develop in the postoperative period, have been briefly discussed. Such complications are by no means infrequent and the best way to manage them is to prevent them. They are difficult to correct when once they have become established, and the development of

one complication often leads to the development of another or of several others.

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## BLOOD TRANSFUSION IN LOUISIANA

A PROBLEM IN ADEQUATE MEDICAL CARE

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## PREFACE

In a limited way one may define medical care in terms of diagnostic and therapeutic services personally rendered by the doctor to the patient. This is the traditional physician-patient relationship, the very essence of the healing art, and the practitioner must closely scrutinize all extraneous factors which appear to influence it.

During the present century it has been increasingly exposed to external vectors of scientific, economic and political nature. That some of these have been beneficial is apparent by the elevated standards and broadened scope of medical care in the United States. It is no less evident that others of these forces lead toward the police state via federalization of medicine, ultimately to a form of existence by directive. This is a trend which must be vigorously resisted in every possible manner.

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The individual doctors who comprise the organized medical profession of the United States must realize that adequate medical care often entails much more than the personal services of the physician or surgeon. If he is to discharge competently his professional obligations to the patient, the practitioner must utilize a number of specialized services and facilities provided by nonmedical people. An outstanding example is the modern hospital, an institution providing important adjuncts to the practice of medicine, many of which are under nonmedical administrative control. There is in the final analysis no clear demarcation between the administrative and medical aspects of a hospital, since all administrative phases influence to some extent at least the basic physician-patient relationship. Limits of lay control must be as clearly delineated as possible, and the ultimate professional authority of the doctor no less clearly recognized. These comments are by no means intended as a reflection on administrative officers, who carry a great burden of highly specialized and detailed work, and without whom the practice of medicine would be extremely burdensome to say the least.

Statistical studies frequently analyze the costs of illness into "medical care," "hospital care" and "medicines." The writer (who is certainly no statistician) believes that there can be no true distinction between medical care (doctor's fees) and hospital care, since they are intimately related to each other and to the broad concept of the public health. Hence the term "medical care" used herein is an all-inclusive one.

It behooves the practitioner to take an active interest in the economics of medical care beyond his personal financial interest. The writer holds that the organized medical profession must concern itself with the cost of illness and must in the broadest possible sense do all in its collective power to make available the very best medical care at lowest possible cost. A small but very important part of that very best is adequate blood bank service.



## BLOOD TRANSFUSION THEN AND NOW

Only a few years have passed since blood transfusion was notable chiefly as a "last resort" or desperate effort. Although the idea of elective transfusion became increasingly accepted such therapy still remained a time-consuming procedure in most instances, because compatible donors had to be located, a task sometimes requiring literally days. Postponement of major surgery because of a dearth of donor blood was a not infrequent occurrence.

Such difficulties, remember, existed when we had only to consider the four major blood groups. As knowledge of the Rh complex and human isoimmunization has evolved the situation has become progressively more complicated. Without the development of blood banks and their accessory services really adequate transfusion service would be improbable, to say the least.

In Louisiana there are at present fifteen functioning blood banks distributed as follows:

Alexandria	1	(private hospital)
Baton Rouge	2	(private hospitals)
Lafayette	1	(state charity hospital)
Monroe	1	(joint project of health department and Red Cross Chapter)
New Orleans	4	(private hospitals)
	1	(state charity hospital)
	2	(federal hospitals)
Pineville	1	(state charity hospital)
Shreveport	1	(private nonprofit foundation)
Shreveport	1	(state charity hospital)

In hospitals served by efficient blood banks the doctor merely orders blood as he does any other medication, specifying only when and how much. Now a blood bank is something more than a refrigerator with two or three containers of blood sitting on a shelf. Actually it must be a medical laboratory facility equipped and staffed regularly to collect, test and classify human blood; to store it under controlled conditions in adequate amounts of each of the eight major group-Rh classifications; to issue such blood as needed at any time. A blood bank renders both diagnostic and therapeutic services.

Most of the several hundred blood banks now in existence in the United States were established by and are operated for the benefit of specific parent hospitals, each of which has been primarily concerned with its own donor procurement problems and has followed its own ideas about blood bank procedures. Recent years have seen this somewhat narrow philosophy, influenced by a number of events, develop into a better understanding of the blood bank's relationship to the public health and safety. It has become evident that adequate transfusion service in any locality is at its roots a community problem since every member of the population, regardless of sex, age, or race, is potentially concerned as donor or recipient. Catastrophes such as the Coconut Grove fire and Texas City explosion emphasize the necessity for coordination of transfusion services with general disaster preparedness plans.

Hence, a really adequate transfusion service is one which can competently supply normal demand and can rapidly and efficiently expand in time of disaster in peace or war. It is essential that the community obligations of the blood bank be recognized by the local medical profession and hospital directors, and above all by the public. People must be indoctrinated with the idea that blood cannot be replaced by money and must be made aware of the moral responsibility of the recipient or his family to see that all loans are repaid to the bank. Further, the man in the street must be impressed with the necessity of providing for blood needs in advance whenever possible.

Obviously not every community in Louisiana is sufficiently large to maintain a blood bank. Yet no person residing in the state should be denied access to such a life-saving service. To serve people living in or near the larger cities where banks are established presents no major difficulties. What is badly needed is an extension of services into smaller towns and rural areas. This calls for the development of a statewide blood bank program, and for an excellent example of such we may look at Florida,

where the Florida Association of Blood Banks, an affiliate of the American Association of Blood Banks, has an excellent service.

The Florida Association is comprised of autonomous blood banks located in several communities about the state. Through cooperative efforts the various banks have adopted standard technical and administrative methods and have provided for interchange of blood between member banks. Rural communities take active part in the program through mobile donor units sent out by nearby banks. Blood is not sold, but all private patients who receive transfusions are billed for laboratory service charges. Charity patients are served without charge.

The Association enjoys the cooperation of the State Health Department, and the Florida Highway Patrol, the latter agency providing emergency transportation of blood by means of its radio patrol cars. The endorsement and active support of the Florida Medical Association contributed greatly to the development of the service.

The existing blood banks in Louisiana provide a structure on which, under professional leadership of the Louisiana State Medical Society, a service of similar magnitude may be provided for the people of this state. An effective program will be based on:

1. Voluntary standardization of technical procedures and apparatus on the part of the blood banks now in operation.

2. Establishment of new blood banks where needed and their coordination with existing facilities.

Since blood bank administration is so intimately related to medical practice it seems logical that the Louisiana State Medical Society should assume the leadership in developing the program, and that the component Parish Societies should take similar duties locally.

#### FACTORS INFLUENCING BLOOD BANK ORGANIZATION

The establishment and operation of a blood bank, either as a hospital department or a central community service, requires

careful study of a number of details, notably the following:

1. Total population of the community and its normal business area.
2. Ratio between white and negro races.
3. Number of hospital beds available.
4. Type and amount of surgery being done.
5. Number of transfusions being given per month.
6. Provision of location and equipping blood bank.
7. Availability of trained personnel.
8. Blood donor procurement.

As already mentioned, the mission of a blood bank is to provide compatible blood on call at any time. No bank can continue to do this unless it receives a constant inflow of replacement donors to balance withdrawals, and further, unless it has supplementary donor lists to provide additional blood when needed. The blood bank is not intended to sell blood, but to lend it. A constant turnover is essential in maintaining a balanced supply of blood. This is the fundamental problem in blood bank administration and cannot be solved by "putting on a drive for donors". Donor recruitment must be constant; it must be on a permanent basis, and this concept must be kept in the public mind at all times.

From the purely medical point of view blood donors should be selected primarily on the questions of transmissible disease and physical ability to donate. These are the only criteria used by many blood banks in the North, where no regard is made of racial origin of the blood. However, those of us who live in the South are not permitted such an easy solution of the problem, although blood purchased from northern banks is still used in a number of southern hospitals. To meet our need a statewide blood bank program must serve all elements of the population; hence, where hospital beds are provided for negroes, there must be a corollary transfusion service. We are faced with long standing social attitudes which compel the classification and separation of bank bloods on a racial basis. However ridiculous this idea may be scientifically it exists and perforce must be recognized in any plan which may be evolved. The members of the Louisiana State Medi-



cal Society should make every effort to encourage the Negro medical leaders to solve this problem by their own efforts, aided by every possible bit of assistance that we can give them in establishing blood banks for the people of their race. Such banks already exist in certain state charity hospitals.

The majority of blood bank administrators in the United States are of the opinion that the recipient of transfusions or his family bears a moral obligation to see that all blood loaned is repaid to the bank. Existing blood banks use many different ways to publicize this, including various printed forms and circulars. However, nearly all of the independent blood banks in the United States have found that the most consistently workable means of stimulating repayment of blood loans is the so-called replacement or responsibility fee, an additional amount which is added to service charges rendered pay patients, and which is refunded as soon as replacement of blood has been made. By this means the blood banks are able to replace from 80 to 95 per cent of the blood they lend. The deficit is made up by voluntary donations from special groups and by purchase of blood in some cases from professional donors. Larger communities which serve as medical centers have a chronic problem with a blood deficit, because every year many sick people from other places come to them for hospitalization, and a considerable number require blood transfusions.

Another recourse is to appeal to the public at large for voluntary donations to make up any blood deficit which occurs. Except in the event of catastrophe such as the Texas City disaster response is usually notably poor, and even in extreme emergencies the great majority of people lose interest in a few days insofar as donating blood is concerned. This was definitely true of the Texas City case.

One may choose to disregard entirely the principle of moral responsibility for repayment and consider that the recipient and his family are not obligated in any way to repay loans. In this case one can only try

promiscuous appeals to the general public. In peacetime such procedure is doomed to ultimate failure because of public indifference. People soon tire of and then disregard the high pressure publicity which such a system must employ at all times if it is to produce any blood donations at all.

If a blood bank is to function efficiently it must process from 100 to 150 transfusions regularly each month. Otherwise the turnover will be insufficient to maintain a working stock. The usual experience has been that wherever a blood bank has been established the number of transfusions per month has manifested an immediate and sustained increase. Since compatible blood is easily obtainable from the bank the doctors soon begin to make more liberal use of transfusion therapy. It can be appreciated that most hospitals of less than 200 beds would find it difficult to maintain full time blood bank service.

However, it is not necessary that all of the beds in a given community be in one hospital. They can be, as they frequently are, distributed among a number of smaller institutions. In such a situation the hospitals can pool their efforts and with community support establish a central blood bank. This can be located in its own building or on the premises of one of the hospitals. It is preferable that the center occupy its own quarters, although this arrangement is initially more expensive. In the long run it would be the most desirable arrangement because of greater efficiency, and because the glory and headaches would be more equitably distributed among the various hospitals.

Many towns, even some having hospitals, are too small to maintain blood banks. Their transfusion needs can be met in a number of ways, the most effective and economical being the "walking blood bank". This is a list of physically qualified persons who have been grouped and Rh typed and have certified their willingness to serve as donors whenever called. This type of program should be a community affair. The file of donor records is kept at some central point where it is available for reference at

any hour of the night or day. A statewide program would actually provide bank blood for emergencies in the smaller towns. Mobile unit services would allow local residents to donate and establish blood bank credits for their community in advance of need.

Since a blood bank is a medical laboratory facility it should be under medical supervision of a licensed physician, preferably one especially qualified for the field. Medical technicians must be especially trained for blood bank work. An increasing number of larger blood banks over the country, through the American Association of Blood Banks, are making available courses of instruction for technicians. The importance of adequate training is emphasized by the fact that the preparation of blood for transfusion is the only clinical laboratory procedure in which a technical or clerical error can lead directly to the death of a patient.

#### THE AMERICAN RED CROSS AND BLOOD BANKING

At the termination of the recent war the American Red Cross proposed to establish a national peacetime blood program by organizing blood banks in numerous communities throughout the United States. The proposal was further made that such facilities would operate complete blood bank programs including donor recruitment and the collection, processing and distribution of blood. All of this service was and is to be rendered "free of charge" to the general public. Presumably, the Red Cross would only establish a bank in a community upon invitation of the local medical society, seconded by the hospital council, and it is further presumed that it would not establish a bank in any town where the service is already in operation.

The American Red Cross has persistently maintained that its blood banks would be (and in the case of those in operation, are) under "supervision" and control of local medical societies. The writer is not certain as to just what this really means. It will be recalled that in April, 1948, the House of Delegates of the Louisiana State Medical Society went on record as opposing the in-

trusion of the Red Cross into blood banking, considering this to be an invasion of the practice of medicine by a lay organization. The National American Red Cross has persistently tried to establish a blood bank in New Orleans and in other Louisiana communities during the past two years. One may be assured that we have not heard the last of this, and we are not likely to.

Already the American Red Cross is operating a number of regional blood banks, for example, in Rochester, New York; Boise, Idaho; Portland and Yakima, Washington; as well as in a number of other cities. The writer has been reliably informed that many of these blood banks, indeed most of them, have been unable to meet the demand for blood in their respective communities. The writer does not believe that any of these Red Cross centers have been in operation long enough for one to establish a definite opinion about them.

Presumably because of its brilliant record in wartime donor procurement for the armed services the American Red Cross expects to obtain vast quantities of blood in peacetime by promiscuous appeal to the public. As indicated previously this concept is very badly discredited by the experience of nearly every independent blood bank in the United States. The majority of blood bank administrators believe that recipients able to do so should pay the necessary blood bank service charges, and that blood bank services should be made available without cost to deserving charity patients. Blood bank service fees are no more nor less than charges for a specialized form of medical care, and this principle is in complete accord with the traditions and usage of medical practice as we have known it in this country.

Is there actually such a thing as free blood bank service for all? The American Red Cross proposes to subsidize the program, but the money necessary to finance it must come from the purse of every one who contributes to that organization. It is more than probable that such a program would tend to discourage the fulfilment of



personal obligations on the part of recipients and their families and would invite charity where it is not needed, thus giving stimulus to the "something for nothing" idea, which is much too prevalent already. The question of "free blood" for charity patients is frequently raised. The writer cannot perceive how the status of being a charity patient in any way absolves the family of said individual of its moral responsibility of repaying blood loans. This is entirely beside the question of paying for the technical services incidental to procuring, processing and administering blood. Actually all blood per se should be free, and the ideal blood bank should function only as a trust company, having nothing for sale except service. This is one of the basic aims of the American Association of Blood Banks and is a point on which it is in entire agreement with the American Red Cross. The latter organization, however, has consistently refused to countenance the replacement fee and has appeared to ignore the combined experience of several hundred independent blood banks in this matter.

There are certain phases of blood banking in which the American Red Cross is very well suited to take an active part, such as donor recruitment, transport and canteen services, publicity, and the stockpiling of emergency supplies of blood collection and administration apparatus at strategic points about the country.

When one considers the frightful quantities of blood which would appear to be needed in event of an atomic catastrophe, or even the hundreds of pints required in less spectacular disasters, one cannot escape a belief that the American Red Cross offers the best immediately available framework on which to build a nationwide blood bank program. It is an organization highly skilled in disaster relief work, and further by means of its three thousand or more local chapters it can rapidly obtain the basic standardization of technics and apparatus so essential to an efficient national service. The American Association of Blood Banks is striving for this through its educational program and bringing standardization by

the voluntary cooperation of its independent member institutions.

Returning to more local affairs the writer would personally not be upset if the American Red Cross wanted to open a blood bank in New Orleans tomorrow morning, provided he had the privilege of submitting the following questions to that organization:

1. Will Red Cross guarantee 100 per cent of the blood and plasma requirements of the community without any recourse to replacement fees?
2. What percentage of blood collected locally would be diverted from the city to the plasma fractionation program?
3. Would the Red Cross blood bank demand that all donors be bled by it and that the hospitals must stop collecting blood?
4. Would the local medical society be permitted to name the medical director and other professional workers?
5. By whom would said medical director be paid?
6. Would the medical director be in full charge of the bank, or would there be a division of authority with an administrative director?
7. Would the local medical society have the privilege of discharging the medical director or any other professional worker for due cause?
8. To what extent would research on an independent basis be permitted?
9. Would the local medical society have the right to establish minimum requirements for blood donors?
10. Would the American Red Cross consider co-operating with the existing blood banks in the community in enlisting donors and providing transport and canteen services?

Let any doctor who is faced with the problem of Red Cross opening a blood bank in his community remember to ask these questions. The writer guarantees that they are quite pertinent.

#### THE AMERICAN ASSOCIATION OF BLOOD BANKS

For more than eight years the writer has been engaged full time in the medical specialty of blood bank administration. More recently as a member of the Executive Board of the American Association of Blood Banks he has applied that experience in assisting to formulate one of the basic policies of the Association—that blood banking is a part of the practice of medicine and as such can best be administered under responsible control of local, independent,

nonprofit institutions under the professional supervision of local medical societies.

The Association has been endorsed in principle by the Orleans Parish Medical Society, the House of Delegates of the Louisiana State Medical Society, the American Society of Clinical Pathologists, the American Medical Association, and numerous county and state medical societies throughout the country.

The American Association of Blood Banks proposes to extend blood bank service throughout the nation and to raise its standards by means of education and the voluntary cooperation of component Institutional Members. Further, it believes that there is a definite place for the American Red Cross in this field, but that it should be restricted primarily to the non-medical phases already mentioned.

The American Association of Blood Banks believes that in its approach to the problems discussed herein it stands on the side of the organized medical profession and is ready to assist the physician in providing his patient with an essential medical service. If the Association is to succeed therein it must have the active support of every member of organized medicine.

#### CONCLUSION

The organized medical profession of Louisiana bears the major responsibility

for the adequate medical care of over two and one-half million people. An essential part of such care is efficient blood bank and transfusion service available in both urban and rural areas. Such a service must be adequate for ordinary demands and must be able effectively to expand to meet unusual emergencies arising in peace or war. It must further be coordinated with blood bank programs in the other states in creating a nationwide service of blood preparedness for disaster.

Blood banking, while basically a medical activity, cannot be considered as the exclusive domain of the medical profession or hospitals. Blood banks and transfusion programs must be approached as community problems. Cooperation of the general public is absolutely essential and can be obtained by soliciting the active support of every type of organization in the community. Without such cooperation blood donor procurement will be insufficient to maintain efficient blood banks.

Control of medical aspects must remain in the hands of the medical profession, which is the most logical agency to provide the active leadership which must not only initiate the program in Louisiana, but must maintain its professional standards once it has been established. Herein lies a challenge to the Louisiana State Medical Society to take up this burden of leadership.



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## PREPAYMENT MEDICAL CARE PLANS

Prepayment medical care plans are a substantial part of what is needed to prevent State medicine. Their rate of progress and growth should be known and appreciated by every member of organized medicine. It will be seen by further consideration of the matter that they are of immense service to the public, and of very material service to the profession itself. So far as the public is concerned, the uncertainty of a large expenditure is replaced by the certainty of a small one. This, in brief, constitutes the advantage both to the public and to the physician.

At present, more than 34,000,000 persons are enrolled in various types of pre-

pay surgical programs, and well over 13,000,000 are enrolled in voluntary prepay plans covering medical and/or surgical care. The majority of the latter are enrolled in medically sponsored or approved plans; these plans as many physicians know, are spoken of as "The Blue Shield" plans, of which there are now 67. By way of comparison, it is of interest to note that these have all developed since 1943. While, in contrast, the Blue Cross, which started earlier, has 90 plans covering 61,000,000 persons in the field of voluntary prepayment hospitalization insurance. The Blue Shield estimates that by the end of the current year there will be 15,000,000 persons enrolled; by the middle of 1950, approximately 17,500,000. The service rendered by Blue Shield in its 67 different organizations in 1948 was startling in amount. It disbursed \$62,400,000 in payment of some 1,000,000 bills to some 100,000 physicians. Approximately 80 cents of every membership dollar is being paid out to physicians for medical or surgical care.

In months past, the AMA's Council on Medical Service has assisted with the overall promotion and coordination of all voluntary medical care plans. The national service or trade organization for the individual local medically sponsored plans was incorporated in March 1946 under the name "Associated Medical Care Plans." It is under the direction of Paul R. Hawley, M. D., chief executive officer, and Frank E. Smith, as director. L. Howard Schriver, M. D., a Cincinnati surgeon, is president of the national organization.

It is anticipated that under this leadership, in the near future, there will be a national company, which will be able to do business in any part of the nation. There are some 10,000 or more firms, which are themselves national in extent, and which desire to deal with one company and not the 67 local organizations. It is felt that such a national company would fill a very necessary part of prepayment medical care, but it is not planned that it should supersede in any way the local plans now in

operation, which are inherently best to serve the local interests.

The types of policies offered by these various plans fall into three general groups: (1) The service policy. In this the physicians offer services as scheduled in the contract at a flat fee. (2) Indemnity policy, which offers payment up to a certain amount for each type of care according to schedule. (3) The combination service-indemnity policy, in which services are provided for lower income groups but which becomes limited by an indemnity schedule when the patient's income tops a certain level. In most States these various plans are subject to the insurance laws of the State. The control of the majority of these plans is in the hands of physicians whose organizations started and financed them. Approximately two-thirds of the Boards are doctors and one-third laymen. The success of these plans is in no small degree dependent upon the cooperation of the physicians, who have concern to insure that care is limited only to that which is needed by the patient. In other words, the insurance organization pays only for necessary surgery.

The advantages of voluntary prepayment medical care are those of insurance in any field. Particularly, however, in the field of medicine the advantages are briefly, as follows: The individual is assisted in budgeting for and securing protection against the expenses of catastrophic illness. The free choice of a physician is assured and mandatory. The control of the organization remains in the hands of the doctors.

The over-all cost of medical care has increased greatly. Of this, patient's fees

amount to only a small part of the increase. These prepayment plans assist in taking care of a large part of the doctor's fee. Prepayment tends to reduce the size of the population which goes to make up the indigent problem.

Louisiana Physicians Service, our own prepayment medical care plan,—thanks to the diligence and intense application to duty of the officers,—is rendering valuable service. It has now been in operation three years. As all members should know, it functions separately from the Louisiana State Medical Society, but is entirely owned by the Society. Some 40,000 individuals are covered by its policies. The annual income on these policies is in excess of \$325,000 a year. In its existence so far it has paid a total of 10,000 claims, the money from which went into the pockets of the individual members of the profession. Its growth and service to the profession has been most gratifying. When we reflect on the growth over the nation as a whole of prepayment for medical care, and also consider our own situation and the valuable part that Louisiana Physicians Service is playing, we should congratulate our leaders, nationally and locally.

For too long a time have the medical organizations separated themselves from the economic aspects of medical care. At long last we are discovering how best we could serve the public interests, and incidentally, that of medicine as a whole. It should be the duty of every member of organized medicine to promote and support the operation of the prepayment medical care plans.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### AMA CLINICAL SESSION

The 1950 Clinical Session of the AMA will be held in the Nation's Capital, December 6-9. This is the third annual clinical

session and attention will be focused upon the diseases and conditions most frequently met by the general practitioner. The program for the session includes *scientific lec-*



*tures and clinical sessions* on a most interesting variety of key topics by doctors who are outstanding authorities. The *scientific and technical exhibits* will dramatize developments in the progress of modern medical practice. *Actual surgical procedures* originating in Johns Hopkins hospital will be shown by *color television*. This will be a demonstration similar to that presented in Atlantic City during the annual meeting last June which proved of such intense interest to the doctors present.

A feature of the Clinical Session will be the award to the physician who is selected as the "General Practitioner of the Year". In the past two years this award has come to be recognized as high honor and has been a definite step toward bringing the recognition that is his due to the family doctor. The procedure for selecting the physician who is to receive this high award is as follows: Each parish and district medical society is given the opportunity to nominate a doctor; the State Society, through the Executive Committee, selects a candidate from this group, awards him recognition as the outstanding general practitioner for the year from this state and then submits his name to the Board of Trustees of the American Medical Association. The Board selects three names from those submitted by the various states and from this list the House of Delegates of the AMA selects the one man designated to receive the award of general practitioner of the year. Last year the Louisiana State Medical Society selected Dr. Charles M. Horton, of Franklin, as the outstanding general practitioner of Louisiana for 1948 and after his qualifications were reviewed by the Board of Trustees of the AMA his name was included on the list of three doctors voted upon by the House of Delegates. This

was considered a great honor to Dr. Horton and to Louisiana. Nominations for the 1949 award have been received by several component societies in Louisiana and the recommendations are at this time being considered by the Executive Committee.

The Secretary of the AMA, Dr. George F. Lull, states as follows in a recent communication referring to this Clinical Session: "A record attendance of the country's general practitioners is sure to impress lawmakers and public officials with the unity and purposefulness of the medical profession. Resulting national publicity is certain to impress the general public with the extent to which doctors go to get 'post-graduate courses', thus guaranteeing patients the best and most up-to-date medical care."

The highlight of the *entertainment* program will be on Wednesday evening, December 7, when there will be a broadcast of Ralph Edward's famous radio show, "This is Your Life", followed by a stage show, to which all attending the session are invited. Key figure of the broadcast will be a general practitioner whose identity will be kept secret until the broadcast begins.

It is hoped that many physicians from Louisiana will attend this Clinical Session of the AMA which, from all indications, will be an outstanding meeting. Hotel reservations are available and these may be secured by sending request to the Chairman of the Subcommittee on Hotels, American Medical Association, Hotel Reservation Bureau, Star Building, Washington 4, D. C. For convenience of the doctors a form for requesting accommodations is carried in the Journal of the AMA each week. Be sure to attend to this without further delay.

# LOUISIANA STATE MEDICAL SOCIETY NEWS

## C A L E N D A R

### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

#### SOUTHERN PSYCHIATRIC ASSOCIATION

The Southern Psychiatric Association, with Dr. Walter Otis (New Orleans) as president, Dr. R. Burke Suitt (Durham), vice-president, and Dr. Newdigate Owensby (Atlanta), secretary, is meeting in New Orleans on November 27 and 28, 1949. Headquarters will be at the Roosevelt Hotel.

This association is a flourishing society. It is the largest, geographically speaking, of the regional psychiatric organizations in this country, and embraces exactly the same territory as the Southern Medical Association, that is, the sixteen Southern States and the District of Columbia.

The Southern Psychiatric Association was organized in Memphis, in 1935. It has 154 members, who by heritage and training, for the most part are conservative in outlook and practice. The association has been meeting yearly since its organization, with the exception of the period of the War. Since the War, annual meetings have been resumed. The Board of Regents of the organization has set down rather rigid standards for admission to fellowship. It is reported that they prefer men who are diplomates of the American Board of Neurology and Psychiatry, or men whom they feel will likely become diplomates.

At various times, programs have been given by men from other sections. On certain occasions, the presentations have covered various points in the whole field of medicine where contact with psychiatry was significant. The program this year will consist of papers given by members and by eminent guest speakers.

The association is to be congratulated on its vigor and on the service it renders to the psychiatrist of the South.

Shreveport; Dr. Irving J. Glassberg, New Orleans; Dr. Glen R. Johnson, Mansfield; Dr. H. Allen King, New Orleans; Dr. Wendell H. Kisner, New Orleans; Dr. V. Hugh Price, Lake Charles; Dr. Joe D. Talbot, Shreveport; Dr. George W. Vickery, New Orleans; Dr. Simon V. Ward, New Orleans; Dr. James W. Welch (deceased) Alexandria.

The American College of Surgeons has around 15,570 Fellows in the western hemisphere and in a few countries overseas. It was organized in 1913 to elevate the standards of surgery. One of its best known activities is hospital standardization; 3,150 hospitals were on the last approved list, published in January, 1949. Clinical research, particularly in cancer; approval programs for cancer clinics, cancer detection centers, medical services in industry, and graduate training in surgery; production and approval of medical motion pictures, and literary research are among other activities.

#### 1949 GENERAL PRACTITIONER AWARD

The Executive Committee of the State Society has selected Dr. Charles M. Horton, as the outstanding general practitioner of Louisiana for 1949. It is felt that this is an honor well deserved by Dr. Horton, who was also selected for this recognition in 1948.

It is hoped that the Board of Trustees of the American Medical Association will accept the recommendation of Dr. Horton by the Louisiana State Medical Society for national recognition and that his name will be presented to the House of Delegates of the AMA to be voted upon for the national award. Biographical sketch and other data have been forwarded to the American Medical Association with this object in view.

Congratulations Dr. Horton, and sincere wishes for the AMA award which you so much deserve!

#### AMERICAN COLLEGE OF SURGEONS

Nine hundred and twenty-one initiates were received into fellowship and eight honorary fellowships were conferred by the American College of Surgeons at the Convocation on Friday evening, October 21, the closing session of the thirty-fifth annual clinical congress in Chicago.

The following from Louisiana were admitted to fellowship: Dr. Alfons R. Altenberg, Monroe; Dr. Clarence E. Boyd, Shreveport; Dr. Eugene H. Countiss, New Orleans; Dr. A. Penn Crain, Jr.,

#### WORLD MEDICAL ASSOCIATION

The first general assembly of the World Medical Association met in Paris, September 1947, with forty-five national medical organizations represented by 125 delegates and Dr. L. H. Bauer, of Chicago, was elected Secretary General. This organization was effected for the purpose of replacing L'Association Professionnelle Internationale des Medecins, which was organized in 1926 and



became inactive after war began. The objects of the organization, as expressed in the By-Laws, are (1) to promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available; (2) to maintain the honor and protect the interest of the medical profession; (3) to study and report on the professional problems which confront the medical profession in the different countries; (4) to organize an exchange of information on matters of interest to the medical profession; (5) to establish relations with, and to present the views of the medical profession to the World Health Organization and other appropriate bodies; (6) to assist all peoples of the world to attain the highest possible level of health; (7) to promote world peace.

The House of Delegates of the American Medical Association has approved this organization and the Executive Committee of the Louisiana State Medical Society feels that members of the Society should participate in the Association in order to be kept closely informed of world events in medicine and be able to assist in raising the standards of medicine and health throughout the world.

Individual membership is \$10.00 a year and checks should be sent to the United States Committee, Inc., World Medical Association, 2 East 103rd Street, New York City.

#### FOURTH DISTRICT MEDICAL SOCIETY

The Fourth District Medical Society held its meeting at the Shreveport Charity Hospital, October 4, 1949.

A Symposium on Pediatrics was held in the afternoon. The following papers were given: 1) "Congenital Heart Disease" by O. D. Thomas, M. D., 2) "Tularemia in Children" by Harold Levy, M. D., 3) "The Use of Alidase in Pediatrics" by Charles E. Anderson, M. D., and 4) "Infantile Eczema" by R. C. Tilbury, M. D.

A round table discussion followed, and dinner was served at 7:00 p. m.

In the evening, Dr. Clarence E. Webb, Shreveport, gave a discussion on "Newer Concepts on Treatment of Upper Respiratory Infections."

The following officers were elected: J. E. Holoubek, M. D., Shreveport, President; V. M. Fletcher, M. D., Ringgold, Vice-President; O. D. Thomas, M. D., Shreveport, Secretary-Treasurer; W. C. Gray, M. D., Springhill, Delegate; J. E. Holoubek, M. D., Shreveport, Alternate Delegate.

The retiring officers were: W. C. Gray, M. D., President; R. H. Van Horn, M. D., Mansfield, Vice-President; J. E. Holoubek, M. D., Secretary.

#### DR. L. ROLAND YOUNG, CLINICAL DIRECTOR, EAST LOUISIANA STATE HOSPITAL, JACKSON, LOUISIANA

Dr. L. Roland Young, formerly of Covington, Louisiana, and for the past five years at Daytona Beach, Florida, has recently accepted the position of Clinical Director of the East Louisiana State Hospital, Jackson, Louisiana. While in Daytona Beach, Dr. Young practiced endocrinology as well as neurology and psychiatry. Prior to going to Daytona Beach he was for six months Senior Psychiatrist on the staff of the Taunton State Hospital, Taunton, Massachusetts.

#### FIRST ANNUAL FOUNDERS DAY FORUM OF THE IBERIA PARISH AND THIRD DISTRICT MEDICAL SOCIETIES

The Medical Society of the Third Congressional District presented the First of its Annual Founders Day Forums at the Frederic Hotel in New Iberia, Louisiana, on November 19, 1949. The Iberia Parish Medical Society acted as host and members of the profession were cordially invited to be their guests. An excellent scientific program was planned for the entire day. Papers were presented by men outstanding in their respective fields.

In addition to the scientific program a round table luncheon was scheduled for noon with questions and discussion.

## BOOK REVIEWS

*Operating Room Technique:* By Edythe Louise Alexander, R. N. 2nd ed. St. Louis, The C. V. Mosby Company, 1949, pp. 765, illus. Price, \$10.00.

This is a remarkable book. It should be in the library of every hospital. It should be available to any nurse who goes near an operating room. Operating room supervisors should teach their nurses from it and should themselves practice its precepts. These are the considered opinions of a reviewer who is not ordinarily given to enthusiasms.

The author of the book, who is presently the supervisor of the operating rooms of Roosevelt

Hospital in New York, has had contacts with some of the ablest surgeons in the country, as the list of acknowledgments in her two prefaces shows. Although she has undoubtedly profited from the associations, this book is first of all the individual work of an intelligent, interested, experienced, efficient operating room nurse.

The contents cover practically everything that any nurse, be she beginner, scrub nurse, circulating nurse or supervisor, needs to know about an operating room and about the procedures carried out in it. The descriptions are so clear and the illustrations so profuse—there are 668 of them—that it would seem impossible for anyone who used the

book to go wrong on the care of an operating room, the set-up for an operation, her preparation as a scrub nurse, her performance during the operation, or her work as a circulating nurse.

The text is intelligent and logical. It deals with all types of surgical procedures. The space devoted to each operation includes a definition of the procedure, an explanation of its principles, and, if it is called for, a brief anatomic description, often with illustrations; a complete list, usually with illustrations, of the instruments, linen, sutures and other items required for the special procedure, together with instructions as to what is to be laid out and what is to be kept in reserve; a detailed, well illustrated description of how the patient is to be placed on the table (one of the things this particular reviewer frequently finds difficult to have accomplished to his satisfaction); a similarly careful description of how the patient is to be draped; and finally, a step-by-step description of the operation. The latter descriptions are among the most valuable features of the book, for opposite each special step is a parallel account of exactly what instruments, sutures and other equipment are needed for that step. This would seem a practically foolproof method of presentation.

The book also contains an outline of lectures on operating room technic; a set of questions to be answered on them; suggestions and forms for grading surgical nurses' work and recording their experiences; an outline of administrative methods; and descriptions of the duties of orderlies, porters, and other operating room aides.

A great many of the illustrations have (very wisely) been borrowed from well known surgical texts. There are occasional instances in which the choice might have been wiser. Although the individual ligation of the pulmonary vessels is described, tourniquet lobectomy, which is no longer generally used, is illustrated (p. 371). Similarly, the one-suture-line method of end-to-end anastomosis is illustrated (p. 481), although most surgeons now use a double line of sutures. These are, however, minor flaws in a generally excellent production.

It is easy to understand why this book, first published in 1943, is now in its second edition, after being reprinted four times in the first edition. The author has, of course, the correct concept of operating room procedure when she writes, "It must be emphasized that the surgical team functions according to previously arranged plans, which are based on fundamental principles as well as on experience." The reviewer could wish for himself and for other surgeons no better fortune than to operate in an operating room supervised and conducted by the technic described in this book and to be assisted by nurses who had been taught from it and who, preferably, had taken another look into

it just before they scrubbed up or began to circulate.

FREDERICK FITZHERBERT BOYCE, M. D.

*Neurology*: By R. R. Grinker, M. D. and P. C. Bucy, M. D. 4th ed. rev. Springfield, Ill., C. C. Thomas, 1949, Price, \$12.50.

Admitting that he no longer practiced neurology as a discrete specialty, Grinker asked Bucy, who had worked on parts of the book before, to help him revise his book. Bucy, a neurosurgeon and professor of neurology, was an outstanding selection. There is need for such a book as Grinker planned and it is indeed fortunate that Bucy agreed to resuscitate it.

This new edition has been completely revised and many of the undesirable features of the first three editions have been deleted. It has been more than "cleaning out the desk;" it has been rewritten. Its publication is marred by typographical errors which plagued the first three editions, but when one considers that this is an 1100 page book, about a difficult and controversial subject, produced by tremendous industry and scholarship, one is being something of a criticaster to pick at its small failures.

Grinker, now a practicing psychosomaticist, has included no chapter on psychiatry though he has woven well accepted psychosomatic concepts into the whole cloth, thereby adding considerable color.

Bucy has contributed a valuable chapter on the physiology of the motor system about which his own research and clinical study give him the liberty of well formed opinions. These physiologic beliefs though they are in conformity with the consensus of neurophysiologists, are not the final word; yet Bucy's consecution is such that the general reader may not be able to delineate that which is pure conjecture. This section should be bound in looseleaf.

The third edition was divided somewhat unaccountably into thirty chapters. Now, with only eighteen chapters, the fourth edition is much more orderly, requires less searching and seems to allow more comprehensive treatment of the subject. Also the former chapters on anatomy, pathology, and physiology have been incorporated piecemeal into the body of the text. This is a distinct improvement, better correlating disease with structure and function and giving a more dynamic quality to the whole subject.

Although everything Bucy says about cerebral arteriography is true, nevertheless, he minimizes its present widespread use. His emphasis of its dangers too heavily burdened the short paragraph which he devoted to this important procedure. Injections of the intracranial arterial circulation are being done daily all over the world with success and agreeably few complications.

In a similar manner he deplors the grave dangers of surgical treatment of congenital intracran-



ial aneurysms. Although it is a touchy business, nevertheless the statement needs to be further qualified. There has been a steady advance in the surgical treatment, abetted by angiography, and this should be more conspicuously emphasized. If he is writing for the general medical readers, he should not close their minds to a procedure which might save the life of one of their patients, if referred to a competent consultant.

As a whole it is a fine book. Medical students, general medical readers, as well as disciples of the neurologic discipline will continue to read "Grinker" and they should.

FREDERICK C. REHFELDT, M. D.

*Blood Transfusion:* By E. L. DeGowin, R. C. Hardin & J. B. Alsever, Philadelphia, W. B. Saunders and Co., 1949, pp. 587 illus. Price, \$9.00.

The appearance of this textbook is timely as the rapid expansion of transfusion therapy, and the extensive development of blood banks have created an acute need for a unit presentation of the many and complex aspects of the clinical as well as technical problems involved in blood transfusion therapy.

The book is designed for medical personnel whose patients receive transfusions; secondly for those who supervise transfusion services; and thirdly for technicians who perform the necessary tests and procedures.

The text is well integrated and covers a complete range of clinical, immunologic, technical, and administrative subjects relating to the transfusion of whole blood and its major derivatives. Technical procedures are carefully described and well illustrated. The authors are clinicians and the clinical aspects are well presented although occasionally the urge for explicitness leads to pedantry. This is particularly apparent in the discussion of indications for therapy.

The book is, nevertheless, an invaluable outline of the development and current practice in transfusion therapy. It is interesting, well written, and comprehensive. The bibliography is well selected and useful.

PAUL T. DECAMP, M. D.,

*Radiologic Exploration of The Bronchus:* By S. Di Rienzo, M. D., Springfield, Ill. Charles C. Thomas, 1949, pp. 332, illus. Price, \$10.75.

This splendid volume fills a void in radiological knowledge and probably will remain as one of the classical works of medical literature. It should serve as a valuable aid in the accurate diagnosis and localization of pulmonary lesions.

The first three chapters are devoted to the embryology and anatomy of the bronchus. The roentgenologic appearances in the various positions are clearly described and illustrated. Chapters IV

through VII are concerned with the preparation of the patient, technics of instillation of the opaque media, bronchographic characteristics of the normal bronchus, tomography and serial exploration of the bronchus. The paragraph devoted to the physiopathology of the cough is interesting and instructive. The description of the author's technic of bronchography is clear and in detail.

Chapter VIII is concerned with bronchopulmonary malformations and the remaining five chapters cover the pathologic lesions of the lung in which bronchography is of value, such as, bronchiectasis, emphysema, carcinoma, hydatid cyst and suppuration. The physiopathology and the etiological factors in bronchiectasis are clearly illustrated and described. The chapter pertaining to carcinoma of the lung should be carefully studied by every physician who is interested in the diagnosis and treatment of these lesions.

The illustrations are outstanding because of their clarity and wealth of detail. The text is concise but the reader is uncertain, at times, of the loss due to the translation from the original language. In general, the internist, surgeon and radiologist should find this work a necessary and valuable addition to their list of useful books.

J. N. ANÉ, M. D.

#### PUBLICATIONS RECEIVED

Charles C. Thomas, Springfield, Illinois: *Urological Aspects of Spinal Cord Injuries*, by George C. Prather, M. D., Edited by Michael E. DeBakey, M. D., R. Glen Spurling, M. D., and Barnes Woodhall, M. D. *The Sexual Criminal, A Psychoanalytical Study*, by J. Paul de River, M. D., F. A. C. S.

Harcourt, Brace & Company, New York: *Life Among the Doctors*, by Paul DeKruif.

W. B. Saunders Company, Philadelphia: *A Textbook of Physiology*, Edited by John F. Fulton, M. D., Sixteenth Edition, Illustrated. *A Textbook of Surgery by American Authors*, Edited by Frederick Christopher, M. D., F. A. C. S., Fifth Edition.

Froben Press, Inc., New York: *Abraham Levinson Anniversary Volume, Studies in Pediatrics and Medical History*, Edited by Solomon R. Kagan, M. D.

The Blakiston Company, Philadelphia: *The Development of Gynaecological Surgery and Instruments*, by James V. Ricci, M. D.

Paul B. Hoeber, Inc., New York: *Modern Practice in Anaesthesia 1949*, Edited by Frankis T. Evans, M. B., F. F. A. R. C. S., D. A.

J. B. Lippincott Company, Philadelphia: *Medicine of the Year, First Issue 1949*, Edited by John B. Youmans, M. D.

Oxford University Press, New York: *Acute Appendicitis and Its Complications*, by Frederick Fitzherbert Boyce, M. D.

## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

### PAST PRESIDENTS

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 Mrs. Arthur A. Herold, Shreveport, 1930-31.  
 Mrs. Robert T. Lucas, Shreveport, 1932-33.  
 Mrs. John H. Musser, New Orleans, 1933-34.  
 Mrs. T. H. Watkins, Lake Charles, 1934-35.  
 Mrs. Herman B. Gessner, New Orleans, 1935-36.  
 Mrs. James B. Vaughn, Monroe, 1936-37.  
 Mrs. George D. Feldner, New Orleans, 1937-38.  
 Mrs. Frederick G. Ellis, Shreveport, 1938-39.  
 Mrs. S. M. Blackshear, New Orleans, 1939-40.  
 Mrs. Roy Carl Young, Covington, 1940-41.  
 Mrs. Aynaud Hebert, New Orleans, 1941-42.  
 Mrs. Clarence B. Erickson, Shreveport, 1942-43.  
 Mrs. George J. Taquino, New Orleans, 1943-44.  
 Mrs. Rhodes J. Spedale, Plaquemine, 1944-45.  
 Mrs. Paul G. LaCroix, New Orleans, 1945-46.  
 Mrs. Arthur D. Long, Baton Rouge, 1946-47.  
 Mrs. J. W. Warren, New Orleans, 1947-48.  
 Mrs. O. B. Owens, Alexandria, 1948-49.

1948-49

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### MESSAGE OF PAST PRESIDENT OF WOMAN'S AUXILIARY

The annual meeting of any organization marks the close of one year and the start of a new and challenging twelve months. As we survey the months that have passed, we feel a very deep appreciation to all members of the executive board and to each auxiliary member who have contributed generously and efficiently of their time in extending our objects and aims.

The mid-year Board meeting was well attended and successful. The reports of the Parish presidents revealed an active, alert, well-informed membership who worked faithfully to achieve our goals. Louisiana now has a paid auxiliary membership of 900 and a total membership of 906. Some dues are delinquent—May we all strive to reach 1,000 membership in 1949-50.

During 1948-49, the state president had the added responsibility of editing our newly born Auxiliary publication *News and Views*. This proved to



be a real research job, very enlightening, profitable, and enjoyable albeit very taxing at times.

Two definite forward steps were taken in the general business sessions at the Convention in New Orleans when the Auxiliary voted (1) to use two separate sessions for the general business of the Convention instead of the one continuous fatiguing plan of a long business session; and (2) invite the Parish President-Elect to attend the State Executive Board meetings without the privilege of a vote. This in order that they might become schooled in auxiliary work for the job ahead.

Sincere appreciation is extended the Medical Society of the State of Louisiana for its support in general and in particular to the Council of Medical Services. Dr. Freidrichs, Chairman, and Mr. Frank Lais, Jr., Executive director, for publishing and mailing our state publication—"News and Views," to the advisory council, Drs. Grey and Murphy, who gave unselfishly of their time.

Joy and deepest gratitude fill my heart—Joy for the warmth and genuine courtesies that were extended in serving you; and gratitude for the contacts and associations which inspired me to greater effort. As we salute the old and greet the new, may I say again what a pleasure and privilege it has been to work with the Auxiliary Members of Louisiana.

Sincerely,

MRS. O. B. OWENS

#### WOMAN'S AUXILIARY TO AMERICAN MEDICAL ASSOCIATION

1948-49

President: Mrs. David B. Allman, 104 St. Charles Place, Atlantic City, New Jersey.

President-Elect: Mrs. Arthur A. Herold, 731 Oneonta Street, Shreveport, Louisiana.

Treasurer: Mrs. George Turner, 3009 Silver Street, El Paso, Texas.

#### WOMAN'S AUXILIARY TO SOUTHERN MEDICAL ASSOCIATION

1948-49

President: Mrs. Joseph W. Kelso, 307 N. W. 19th St., Oklahoma City, Oklahoma.

President-Elect: Mrs. R. C. Haynes, 755 Eastwood, Marshall, Missouri.

Councilor: Mrs. George D. Feldner, 3814 Louisiana Avenue Parkway, New Orleans, Louisiana.

#### PROJECTS 1949-50

1. Rural Health.
2. Hygeia.
3. Prepayment medical and hospital care.
4. Legislation.
5. Public Relations.
6. Organization.
7. Medical cultural items.
8. Nurse recruitment.

#### ACADIA PARISH (Unorganized)

Bailey, Mrs. John S., Church Point.  
Bruner, Mrs. J. C., Rayne.  
Clark, Mrs. Leon A.  
Faulk, Mrs. J. W., Jr., Crowley.

#### ALLEN PARISH (Unorganized)

Buck, Mrs. Gurdon, Kinder.  
Hargrove, Mrs. W. Rigsby, Oakdale.  
Mayes, Mrs. James W., Jr., Oakdale.  
Saint, Mrs. Charles L., Elizabeth.

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Baker, Mrs. Forrest E., Gonzales.  
Brumfield, Mrs. D. C., Darrow.  
Martin, Mrs. D. T., Donaldsonville.  
St. Amant, Mrs. Guy S., Gonzales.  
Thibodaux, Mrs. P. T., Donaldsonville.

#### ASSUMPTION PARISH (Unorganized)

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Cox, Mrs. N. A., Napoleonville.  
LeBlanc, Mrs. H. A., Paincourtville.  
Pugh, Mrs. T. B., Napoleonville.

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Jeansonne, Mrs. Phillip, Plaquemine.  
Jones, Mrs. H. C., Bunkie.  
Temple, Mrs. H. G., Bunkie.

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Beckcom, Mrs. Floyd N., 13 A Pine Avenue, DeRidder.

Frazar, Mrs. John D., South Division, DeRidder.  
Marcello, Mrs. Luke, 306 Port Street, DeRidder.  
Roberts, Mrs. Sam T., 426 N. Pine, DeRidder.  
Sartor, Mrs. T. R., 201 N. Royal, DeRidder.

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Ferguson, Mrs. R. C., Arcadia.  
McKay, Mrs. Jos. Wm. III, Gibsland.  
Winberly, Mrs. F. F., Ringgold.

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Hall, Mrs. J. B., Jr., Benton.  
Landry, Mrs. L. V., 317 Yarbrough, Bossier City.  
Tucker, Mrs. C. M., Haughton.  
Whittington, Mrs. A. C., Bossier City.

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 Anderson, Mrs. J. R., 580 Ockley.

(Dixie)

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 Boggs, Mrs. H. W., 140 Albany.  
 Boone, Mrs. C. S., 225 Patton.  
 Boyce, Mrs. S. W., 135 Patton.  
 Boyd, Mrs. C. E., 515 Elmwood.  
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 Bryant, Mrs. E. L., 135 Taliaferro.  
 Butler, Mrs. W. P., 130 Patton.  
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 Cohenour, Mrs. H. L., 715 Longleaf.  
 Comstock, Mrs. Glen, 344 Ockley.  
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 Crain, Mrs. A. P., Jr., 836 Columbia.  
 Creel, Mrs. G. A., 851 Elmwood.  
 Crow, Mrs. R. D., 440 Albert.  
 Custer, Mrs. J. L., 1162 Janther.  
 Davidge, Mrs. L. L., 4141 Richmond.  
 DeLee, Mrs. R. B., 368 Albany.  
 DeLee, Mrs. Stuart, 3110 Creswell.  
 DePriest, Mrs. F. E., 847 Kirby.  
 Dickson, Mrs. George, 5806 Fairfield.  
 Dilworth, Mrs. E. E., 646 McCormick.  
 Drummond, Mrs. W. F., 504 Southfield.  
 Duncan, Mrs. Dean H., 759 Wilder.  
 Eddy, Mrs. J. H., Jr., 517 Ratcliff.  
 Edwards, Mrs. E. Clay, 815 Ratcliff.  
 Erickson, Mrs. C. B., 423 Herndon.  
 Flake, Mrs. E. B., 3429 Beverly.  
 Furman, Mrs. F. S., 1756 Line.  
 Gallagher, Mrs. Henry, 189 Archer.  
 Galloway, Mrs. Edgar, 575 Unadilla.  
 Garrett, Mrs. George, 317 Ockley.  
 Gavin, Mrs. J. F., 466 Albany.  
 Gill, Mrs. S. L., 1046 Kingshighway.  
 Gilmer, Mrs. P. R., 851 Olive.  
 Glass, Mrs. T. A., 521 Delaware.  
 Gorton, Mrs. J. M., Lakeshore Dr., RFD 4.  
 Gorton, L. W., Lakeshore Dr., RFD 4.  
 Gowen, Mrs. C. R., 5900 Line.

Gray, Mrs. Leon F., 1901 Centenary.  
 Hall, Mrs. W. M., 838 McCormick.  
 Hargrove, Mrs. M. D., 608 Unadilla.  
 Harmon, Mrs. W. S., 460 Longleaf.  
 Hart, Mrs. W. W., 2324 Scovell.  
 Harwell, Mrs. W. R., 715 Elmwood.  
 Hawkins, Mrs. I. F., 740 McCormick.  
 Heard, Mrs. J. E., 512 McCormick.  
 Heath, Mrs. A. G., 1617 Highland.  
 Heidorn, Mrs. W. B., 572 Unadilla.  
 Hendrick, Mrs. J. V., 448 Elmwood.  
 Hendrick, Mrs. T. A., 134 Boulevard.  
 Herold, Mrs. A. A., 1166 Louisiana.  
 Herold, Mrs. A. A., Jr., 431 Slattery.  
 Hill, Mrs. W. J., Jr., 735 Erie.  
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 Holoubek, Mrs. J. E., 172 Atlantic.  
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 Ilgenfritz, Mrs. Hugh, 360 Olive.  
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 Jones, Mrs. K. B., 286 Carrollton.  
 Jones, Mrs. O. O., 524 McCormick.  
 Jones, Mrs. W. G., 145 Merrick.  
 Kalstone, Mrs. B. M., 4461 Finley.  
 Kelley, Mrs. G. P., 224 Pennsylvania.  
 Kennedy, Mrs. D. W., 116 E. Robinson.  
 Kerlin, Mrs. D. L., 648 Unadilla.  
 Kerlin, Mrs. W. S., 830 Ontario.  
 Kimball, Mrs. D. C., 110 Fremont.  
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 Knighton, Mrs. J. E., Jr., 4041 Baltimore.  
 Knoepp, Mrs. L. F., 240 Carrollton.  
 La Rue, Mrs. C. L., 629 Wilder.  
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 Levy, Mrs. Harold, 327 Ratcliff.  
 Lloyd, Mrs. T. P., 6603 Gilbert.  
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 Mason, Mrs. L. K., 852 McCormick.  
 Matthews, Mrs. M. W., 655 McCormick.  
 Matthews, Mrs. W. R., RFD 2, Box 96.  
 Mays, Mrs. C. R., 844 Oneonta.  
 McCook, Mrs. W. W., Jr., 179 Atlantic.  
 McIntyre, Mrs. D. R., 434 Unadilla.  
 Nicholas, Mrs. A. J., 216 Pennsylvania.  
 Nicholas, Mrs. S. N., 422 Boulevard.  
 Norfleet, Mrs. W. J., 835 Prospect.  
 Oden, Mrs. Pope W., 236 Gladstone.  
 Oxford, Mrs. T. M., 581 Unadilla.  
 Paine, Mrs. R. A., 651 Oneonta.  
 Paul, Mrs. H. W., 1535 Magnolia.  
 Penninger, Mrs. E. L., 1164 Janther.  
 Picard, Mrs. M. S., 321 Atkins.  
 Pirkle, Mrs. L. H., 865 Margret.  
 Potts, Mrs. C. H., 3814 Creswell.  
 Pou, Mrs. J. H., 1030 E. Kingshighway.  
 Quinn, Mrs. H. J., 4414 Richmond.  
 Reed, Mrs. Carson, 335 Gladstone.  
 Rew, Mrs. C. E., 1337 Oakland.  
 Rice, Mrs. Irwin, 427 Wilder.  
 Rigby, Mrs. O. C., 816 Oneonta.  
 Riggs, Mrs. R. H., 586 Oneonta.



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 Rougon, Mrs. I. B., 932 Oneonta.  
 Rutledge, Mrs. C. P., 4334 Richmond.  
 Sanders, Mrs. J. C., 3218 Line.  
 Sanders, Mrs. J. P., 449 Galdstone.  
 Sandidge, Mrs. W. J., 255 Ockley.  
 Scott, Mrs. Leroy, 4010 Maryland.  
 Shavin, Mrs. J. S., 3637 Youree.  
 Simonton, Mrs. E. C., 808 Oneonta.  
 Simpson, Mrs. T. R., 731 Ockley.

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 Smith, Mrs. T. J., 535 Oneonta.  
 Smith, Mrs. W. W., 520 Pierre Mont Road.  
 Stamper, Mrs. J. R., 715 Jordan.  
 Strain, Mrs. T. E., 1031 Erie.  
 Swearingen, Mrs. D. C., 4607 Gilbert.  
 Talbot, Mrs. J. D., 908 College.  
 Taylor, Mrs. Willis, 443 Elmwood.  
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 Thomas, Mrs. O. C., 745 Ratcliff.  
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 Topp, Mrs. O. W.  
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(Maplewood)

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(Lake Charles)

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 White, Mrs. H. D., 1030 Eleventh.  
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 Worden, Mrs. R. W., 822 Clarence.

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 Gladney, Mrs. James F., Homer.  
 Gladney, Mrs. Pat, Homer.  
 Middleton, Mrs. E. B., Homer.  
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 Rivenbark, Mrs. Clotielle, Haynesville.  
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 Wilson, Mrs. J. W., Athens.  
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 Chiarulli, Mrs. E. E., 2952 Beech.  
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 Jones, Mrs. F. J., 939 Convention.  
 Jones, Mrs. Jack R., 6249 Seven Oaks Avenue.  
 Kemp, Mrs. R. C., 616 Park Boulevard.  
 Kern, Mrs. L. J., 4549 Westdale Drive.  
 Kopfler, Mrs. M. E., Jefferson Highway.

(Zachary)

Lane, Mrs. B. B.

(Baton Rouge)

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 Levy, Mrs. M. L., 1429 South 24th.  
 Lobrano, Mrs. I. E., 355 Hearthstone Drive.  
 Long, Mrs. A. D., 1367 Steele Boulevard.  
 Lorio, Mrs. Cecil, 3131 Dalrymple Drive.  
 Lorio, Mrs. L. F., 1046 Drehr Avenue.  
 Marks, Mrs. Paul, 2135 Parker Drive.  
 McConnell, Mrs. C. S., 3100 North Boulevard.  
 McGehee, Mrs. J. W., Jr., 339 Oakwood Drive.  
 McGehee, Mrs. J. W., Sr., 2174 Wisteria.



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 Morris, Mrs. C. T., 2258 Terrace.

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 Nelken, Mrs. B. E., 1416 Perkins Road.  
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 Pickell, Mrs. F. W., 2177 Oleander.  
 Powers, Mrs. J. R., 803 Park Boulevard.  
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 Riche, Mrs. H. Guy, Jr., 2220 Myrtle.  
 Sabatier, Mrs. J. A., 4362 Sweetbrier.  
 Selser, Mrs. R. E., 1957 Cloverdale.  
 Silvey, Mrs. M., 1563 Perkins.  
 Simmons, Mrs. McHugh, 510 East Boulevard.  
 Singletary, Mrs. W. B., 613 Drehr Avenue.  
 Smith, Mrs. C. P., 500 Dubois.  
 Stander, Mrs. Alvin, 2616 Perkins.  
 Stephenson, Mrs. R. T., 2123 Perkins.  
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 Vennard, Mrs. W. O., 2476 July.  
 Voss, Mrs. C. H., 2125 Kleinert.  
 Walker, Mrs. M. A., 1269 Longwood.  
 Wallace, Mrs. Robert, 2285 Kleinert.  
 Williams, Mrs. Lester, 739 Convention.  
 Witter, Mrs. H. B., 2335 Myrtle.  
 Young, Mrs. R. W., 228 Kernan.

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 Landry, Mrs. Paul B., Port Allen.  
 Thomas, Mrs. George E., Port Allen.

## EAST CARROLL PARISH

## (Unorganized)

Cain, Mrs. Frank A., Lake Providence.  
 Davis, Mrs. J. P., Lake Providence.

## EAST FELICIANA PARISH

## (Unorganized)

Jackson, Mrs. Paul T., Clinton.  
 Nolan, Mrs. Leonard S., Jackson.  
 Roberts, Mrs. Wm. J., Jackson.  
 Toler, Mrs. E. M., Clinton.  
 Wilkinson, Mrs. Wm. E., Jackson.

## EVANGELINE PARISH

## (Unorganized)

Aswell, Mrs. Charles J., Jr., Ville Platte.  
 Dupre, Mrs. R. E., Ville Platte.  
 Freeman, Mrs. O. L., Basile.  
 Savoy, Mrs. Frank, Mamou.  
 Vidrine, Mrs. Arthur, Ville Platte.

## FRANKLIN PARISH

## (Unorganized)

Bostick, Mrs. John N., Gilbert.

Jones, Mrs. Henry E., Wisner.  
 Rogers, Mrs. J. D., Winnsboro.

## GRANT PARISH

## (Unorganized)

Brian, Mrs. N. M., Sr., Montgomery.  
 Donaldson, Mrs. D. V., Dry Prong.

## IBERIA PARISH

Mrs. Edwin Landry, President.

## (New Iberia)

Bourgeois, Mrs. D. E., 439 E. St. Peter.  
 Brown, Mrs. C. P., Main Street.  
 Carstens, Mrs. Walter, 615 Center.  
 Crawford, Mrs. Lewis, Marie Street.  
 Dalton, Mrs. Orien, Jeanerette Road.  
 Dauterive, Mrs. Henry, 424 E. Main.  
 DeGravelles, Mrs. C. C., 635 Marie.  
 Dupuy, Mrs. Jules, Marie Street.  
 Flory, Mrs. H. M., 717 Julia.  
 Gajan, Mrs. I. W., Jr., P. O. Box 145.  
 Gonzales-Romo, Mrs. Baltazar, 406 S. Pellerin.  
 Landry, Mrs. E. L., 601 Marie.  
 Landry, Mrs. E. N., 625 Main.  
 LeBourgeois, Mrs. Paul A., 640 E. Main.  
 Pharr, Mrs. J. N., Gorham Place.  
 Slipakoff, Mrs. Leon, 523 Iberia.  
 Tolson, Mrs. John, Olivier Building.

## (Jeanerette)

Villien, Mrs. L. M., 1519 W. Church.

## IBERVILLE PARISH

Mrs. R. D. Martinez, President.

Eby, Mrs. Cyril, Labauve Avenue, Plaquemine.  
 Levy, Mrs. Simon C., 700 Labauve Avenue, Plaquemine.  
 Holloway, Mrs. Eugene, 809 Baist, Plaquemine.  
 Martinez, Mrs. R. D., 605 Court, Plaquemine.  
 Melton, Mrs. Edward C., 321 Haase, Plaquemine.  
 Miller, Mrs. Maxwell, 807 Bayou Road, Plaquemine.  
 Musso, Mrs. J. P., North Main Street, White Castle.  
 Spedale, Mrs. Rhodes, 701 Eden Street, Plaquemine.  
 Tomeny, Mrs. Frank, South Main Street, White Castle.

## JACKSON PARISH

## (Unorganized)

Blume, Mrs. Ernest, Jonesboro.  
 Green, Mrs. Leonard, Ansley.  
 Robinson, Mrs. George H., Hodge.

## JEFFERSON DAVIS PARISH

Mrs. R. S. Kramer, President.

Arceneaux, Mrs. Rosemond R., Welsh.  
 Brunt, Mrs. Charles D., Jennings.  
 Harrell, Mrs. Forrest Worth, Jennings.  
 Kramer, Mrs. Richard S., Jennings.  
 Martin, Mrs. Claude A., Welsh.  
 McClure, Mrs. John G., Welsh.  
 Miller, Mrs. R. Frank, Jennings.  
 Romero, Mrs. John, Welsh.  
 Sabatier, Mrs. Harold, Elton.

Shirley, Mrs. Louis E., Jennings.  
 Shirley, Mrs. L. E., Jr., Jennings.  
 Smith, Mrs. Morgan, Jennings.  
 Taylor, Mrs. Kendrick, Jennings.  
 Turner, Mrs. Dan B., Jennings.

LAFAYETTE PARISH

Mrs. J. Boring Montgomery, President.

(Lafayette)

Azar, Mrs. P. J., 314 W. St. Mary Blvd.  
 Bourgeois, Mrs. Ralph, 504 S. Buchanan.  
 Burdin, Mrs. J. J., 431 Buchanan.  
 Daly, Mrs. O. P., 1316 Lafayette St.  
 Davis, Mrs. F. H., 832 St. John.  
 DeMier, Mrs. A., 314 W. St. Mary Boulevard.  
 Duhon, Mrs. J. O., 730 Jefferson.  
 Fernandez, Mrs. J. M., 311 W. St., Mary Boulevard.  
 Gardiner, Mrs. George V., 504 S. Buchanan.  
 Harrell, Mrs. Edward M., 840 S. Washington.  
 Kurzweg, Mrs. Paul, 312 W. St. Mary Boulevard.  
 Long, Mrs. L. B., 431 S. Buchanan.  
 Miles, Mrs. John, 314 W. St. Mary Boulevard.  
 Montgomery, Mrs. J. B., 518 Oak Avenue.  
 Olivier, Mrs. C. K., 406 Oak Avenue.

(Scott)

Prejean, Mrs. L. A.

(Lafayette)

Saloom, Mrs. C. J., 517 Oak Avenue.  
 Sonnier, Mrs. L. J., 840 S. Washington.  
 Voorhies, Mrs. A. C., Jr., 318 W. St. Mary Boulevard.  
 Wynne, Mrs. E. W., 312 St. Mary Boulevard.

LAFOURCHE PARISH

Mrs. T. U. Kleinpeter, President.

Brown, Mrs. J. W., Lockport.  
 Chatelain, Mrs. L., Cut Off.  
 Daunis, Mrs. C. R., 1109 Lafourche Drive, Thibodaux  
 Jones, Mrs. Guy R., Lockport.  
 Kerne, Mrs. Leo J., Thibodaux.  
 Kleinpeter, Mrs. E. A., Thibodaux.  
 Kleinpeter, Mrs. T. W., Thibodaux.  
 Robichaux, Mrs. Philip, Raceland.  
 Robichaux, Mrs. R. E., Raceland.

LaSALLE PARISH

(Unorganized)

Campbell, Mrs. Guy, Jena.  
 Gaharan, Mrs. P. S., Tullos.  
 King, Mrs. T. E., Olla.  
 Kittrell, Mrs. J. M., Goodpine.  
 Tannehill, Mrs. T. L., Tullos.  
 Thomas, Mrs. F. A., Urania.  
 Trax, Mrs. David L., Trout.

LINCOLN PARISH

(Unorganized)

Bennett, Mrs. J. J., Ruston.  
 Calhoun, Mrs. D. S., Ruston.  
 Crawford, Mrs. J. E., Ruston.

Farmer, Mrs. Wm., Ruston.  
 Featherston, Mrs. R. N., Dubach.  
 Fey, Mrs. William P., Ruston.  
 Foster, Mrs. F. L., Ruston.  
 Gibbons, Mrs. George E., Ruston.  
 Green, Mrs. Marvin T., Ruston.  
 Green, Mrs. M. R., Ruston.  
 Harris, Mrs. John B., Ruston.  
 Johnson, Mrs. J. M., Ruston.  
 Langford, Mrs. Carl L., Ruston.  
 Roane, Mrs. Henry S., Ruston.  
 Smith, Mrs. J. L., Ruston.  
 Thomas, Mrs. John A., Ruston.  
 Van Hook, Mrs. Clyde D., Ruston.  
 White, Mrs. S. L., Ruston.  
 Young, Mrs. E. J., Ruston.

LIVINGSTON PARISH

(Unorganized)

Carter, Mrs. N. W., Holden.  
 Hennigan, Mrs. H. W., Denham Springs.  
 Rosen, Mrs. I. I., Springfield.

MADISON PARISH

(Unorganized)

Allen, Mrs. Dean H., Tallulah.  
 Edgerton, Mrs. E. Otis, Tallulah.  
 Leeves, Mrs. A. G., Tallulah.  
 Provine, Mrs. Henry S., Tallulah.

MOREHOUSE PARISH

(Unorganized)

Rawls, Mrs. Jack, Bastrop.  
 Willey, Mrs. Felix J., Mer Rouge.  
 Williams, Mrs. Guy D., Mer Rouge.

NATCHITOCHES PARISH

(Unorganized)

Addison, Mrs. W. E., Provencal.  
 Bath, Mrs. Jos., Natchitoches.  
 Brown, Mrs. J. N., Campti.  
 Corkern, Mrs. R. E., Natchitoches.  
 Glass, Mrs. J. B., Natchitoches.  
 Moreland, Mrs. W. E., Powhatan.  
 Pattison, Mrs. C. G., Marthaville.  
 Pierson, Mrs. Wm. H., Natchitoches.  
 Pratt, Mrs. J. B., Natchitoches.  
 Roy, Mrs. R. S., Natchitoches.

ORLEANS PARISH

Mrs. Edwin Socola, President.

(New Orleans)

Alexander, Mrs. Aubrey M., Jr., 300 S. Solomon St.  
 Alexander, Mrs. Lucian W., 4010 St. Charles Ave.  
 Alldredge, Mrs. R. H., 1414 Eleanore St.  
 Alsobrook, Mrs. H. B., 450 Lowerline St.  
 Anderson, Mrs. Gilbert C., 5521 Atlanta St.  
 Andrews, Mrs. John D., 1643 State St.  
 Ane, Mrs. Joseph N., 3221 State St. Drive.  
 Archinard, Mrs. John J., 1241 N. Rampart St.

(Gretna)

Atkinson, Mrs. J. W., 320 Huey P. Long Ave.



## (New Orleans)

Aymond, Mrs. Branch J., Jung Hotel.  
 Bacon, Mrs. Edward F., 135 N. Alexander St.  
 Baehr, Mrs. John F., Jr., 3535 Canal St.  
 Bailey, Mrs. James E., 1614 Pine St.  
 Ball, Mrs. Robert C., 3308 Prytania St.  
 Baker, Mrs. Dan, 7811 Willow St.  
 Barkoff, Mrs. Sam, 8320 Palmetto St.  
 Barnes, Mrs. G. C., 2407 General Taylor St.  
 Batchelor, Mrs. J. M., 368 Jefferson Davis Ave.

## (Waveland, Miss.)

Battalora, Mrs. G. C., Box 147.

## (New Orleans)

Beacham, Mrs. Dan W., 5228 Prytania St.  
 Beil, Mrs. Wallace C., 210 Vincent Ave.  
 Bel, Mrs. George, 435 Broadway.  
 Beranger, Mrs. E. J., 6315 Constance St.  
 Bernadas, Mrs. H. C., 2301 Esplanade Ave.  
 Bernhard, Mrs. Robert, 3427 S. Broad St.  
 Bertucci, Mrs. Emile A., Sr., 3011 Napoleon Ave.  
 Bethea, Mrs. Oscar, 1453 State St.  
 Bick, Mrs. John W., 2337 Valmont St.  
 Blackshear, Mrs. S. M., 623 Bourbon St.  
 Blakeney, Mrs. C. C., 1106 Pere Marquette Bldg.  
 Blamphin, Mrs. Arturo, 1023 Fern St.  
 Blandino, Mrs. V. P., 5400 General Diaz St.  
 Bloch, Mrs. Emile, 411 Broadway.  
 Blum, Mrs. Henry N., 1837 State St.  
 Boles, Mrs. James H., 716 Broadway.  
 Boudreaux, Mrs. Philip A., 5400 York St.  
 Bowers, Mrs. S. E., 4923 S. Johnson St.  
 Bowie, Mrs. Eleazar R., 5345 St. Charles Ave.  
 Boyce, Mrs. Fred F., 500 Audubon St.  
 Boyer, Mrs. Richard C., 4975 Miles Drive.  
 Bradley, Mrs. David F., 5828 Fontainebleau Drive.  
 Brau, Mrs. Kermit, 38 Rio Vista.  
 Braunstein, Mrs. Albert L., 3608 State St.  
 Bres, Mrs. Edward S., Jr., 388 Broadway.  
 Brewer, Mrs. Fred W., 1226 Aline St.  
 Brewster, Mrs. H. F., 6501 Oakland Drive.  
 Briel, Mrs. George, 339 W. Livingston Place.  
 Brierre, Mrs. J. E., 4679 St. Roch Ave.  
 Brierre, Mrs. J. Theodore, 4679 St. Roch Ave.  
 Brown, Mrs. Charles L., 27 Neron Place.  
 Brown, Mrs. Cuthbert J., 600 Polk Ave.  
 Browne, Mrs. Donovan C., 4920 St. Charles Ave.  
 Buck, Mrs. Richard L., 1631 Seventh St.  
 Buffington, Mrs. Wiley R., Bienville Hotel.  
 Burger, Mrs. Otto J., 2036 Palmer Ave.  
 Burns, Mrs. Edgar, 4419 St. Charles Ave.  
 Burt, Mrs. Lawrence, 2321 State St.  
 Cabibi, Mrs. Carlo P., 3027 Paris Ave.  
 Cabiran, Mrs. Louis P., 5902 Dauphine St.  
 Caine, Mrs. Ansel M., 5301 St. Charles Ave.  
 Caire, Mrs. Arthur, Jr., 2130 Octavia St.  
 Caire, Mrs. Arthur III, 2130 Octavia St.  
 Cairns, Mrs. Adrian B., 476 Metairie Road.  
 Caldwell, Mrs. Guy A., 1640 State St.  
 Campagna, Mrs. Maurice, 2912 Napoleon Ave.  
 Carlomango, Mrs. Fernando, 2714 Esplanade Ave.  
 Carter, Mrs. Phillips J., 3122 La. Ave., Parkway.

Chalstrom, Mrs. Harry E., Jr., 7017 Apricot St.  
 Charbonnet, Mrs. L. Sidney, 1512 Audubon St.  
 Charbonnet, Mrs. L. Sidney, Jr., 64 Versailles Blvd.

Chetta, Mrs. Nicholas, 3823 Octavia St.  
 Ciaravella, Mrs. J. M., 3449 Gentilly Blvd.  
 Ciolino, Mrs. Jos. J., 4486 St. Roch Ave.  
 Clark, Mrs. Wm. B., 38 Farnham Place.  
 Cohen, Mrs. Hymen L., 630 Burdette St.  
 Cohn, Mrs. Isidore, 2 Everett Place.  
 Cole, Mrs. James C., 2207 Octavia St.  
 Cole, Mrs. C. Grenes, 4938 St. Charles Ave.  
 Colvin, Mrs. Samuel Harvey, 1606 Pine St.  
 Countiss, Mrs. E. H., 6042 Prytania St.  
 Couret, Mrs. John S., 2135 General Pershing St.  
 Crawley, Mrs. Robert J., 357 Millaudon St.  
 Danna, Mrs. Pascal, 1619 Eighth St.  
 Danton, Mrs. Bernard F., 2301 Tennessee St.  
 D'Antoni, Mrs. Joseph, 1825 Calhoun St.  
 Davidson, Mrs. Jules Myron, 100 Fontainebleau Dr.

Davis, Mrs. David A., Foundation Hospital.  
 Debuys, Mrs. Lawrence, 1417 Delachaise St.  
 DeCamp, Mrs. Paul T., 1835 General Pershing St.  
 de la Houssaye, Mrs. Roy, 4917 St. Charles Ave.  
 DeLaureal, Mrs. Boni, 3025 Prytania St.  
 Delery, Mrs. Lucien, 9 Forest Drive.  
 Dempsey, Mrs. George J., 1236 Jackson Ave.  
 Dent, Mrs. John H., 3645 Coliseum St.  
 Depp, Mrs. O. R., 34 Farnham Place.  
 Derbes, Mrs. Vincent J., 7302 Pitt St.  
 DeReyna, Mrs. George, 8211 Apricot St.  
 DeVerges, Mrs. Philip, 4706 Canal St.  
 Diaz, Mrs. Walter, 1656 Dufossat St.  
 Dicks, Mrs. John F., 1595 Exposition Blvd.  
 DiLio, Mrs. John, 3406 Gentilly Road.  
 Dozier, Mrs. Horace B., 8234 Palm St.  
 Dubret, Mrs. John C., 1160 City Park Ave.  
 Duffy, Mrs. Morris, 2229 Pine St.  
 Dunn, Mrs. John S., 8410 Pontchartrain Blvd.  
 Dupuy, Mrs. Homer, Jr., 4304 Coliseum St.  
 Dyer, Mrs. John L., 359 Millaudon St.  
 Edwards, Mrs. Edwin W., 5832 S. Galvez St.  
 Eigenbrod, Mrs. F. A., 4418 Magnolia St.  
 Efron, Mrs. Bernard, 4108 Vendome Place.  
 Emory, Mrs. Mayo L., 4615 Perrier St.  
 Ernst, Mrs. Oliver, 911 State St.  
 Everett, Mrs. Peter, 543 Broadway.  
 Faget, Mrs. Edward B., 1459 Moss St.  
 Failla, Mrs. Anthony, 6026 Mandeville St.  
 Faivre, Mrs. George W., 4333 South Prieur St.  
 Farwell, Mrs. David, 3311 St. Charles Ave.  
 Fatter, Mrs. Esmond A., 5780 Argonne St.  
 Feingold, Mrs. Marcus, 4206 St. Charles Ave.  
 Feldner, Mrs. George D., 3814 La. Ave. Parkway.  
 Fenner, Mrs. Erasmus D., 6323 St. Charles Ave.  
 Fenno, Mrs. Fred, 1630 Napoleon Ave.  
 Fontenelle, Mrs. Irwin, 3424 St. Claude Ave.

## (Bay St. Louis, Miss.)

Friedrichs, Mrs. Andrew, 510 North Beach.

(New Orleans)

Fuchs, Mrs. Val H., 1625 Broadway.  
 Gaethe, Mrs. George, 4223 S. Roman St.  
 Gaines, Mrs. S. R., 107 Friedrichs Ave., Metairie.  
 Gambino, Mrs. Frank, 2914 Esplanade Ave.  
 Garcia, Mrs. John E., 6414 Louis XIV St.  
 Garcia, Mrs. Manuel, 37 Neron Place.  
 Gardiner, Mrs. W. P., 212 Audubon Blvd.  
 Gately, Mrs. Tracy, 4232 Vendome Place.  
 Gauthier, Mrs. Wm. Kohlman, 208 Sycamore Drive,  
 Metairie.

(Gretna)

Gelbke, Mrs. Carroll F., #8 Willow Drive.

(New Orleans)

George, Mrs. Jack, 2526 Metairie Rd., Metairie.  
 Gessner, Mrs. Herman B., 119 Audubon Blvd.  
 Getzoff, Mrs. Paul, 3222 Napoleon Ave.  
 Gillaspie, Mrs. Robert E., 2722 Broadway.  
 Gillaspie, Mrs. W. A., 35 Versailles Blvd.  
 Gillentine, Mrs. W. H., 49 Versailles Blvd.  
 Glassberg, Mrs. Irving, 16 Fontainebleau Drive.  
 Goldberg, Mrs. Max, 2301 Joseph St.  
 Golden, Mrs. Abe, 3706 Vincennes Place.  
 Goldman, Mrs. Allen M., 2337 Joseph St.  
 Goldman, Mrs. Dan W., 2519 Napoleon Ave.  
 Gooch, Mrs. John B., 3021 DeSoto St.  
 Graffignino, Mrs. Peter, 340 Fairway Drive, Metairie.

Granberry, Mrs. Carl, 4030 Vendome Place.  
 Grant, Mrs. George B., 1328 Webster St.  
 Gray, Mrs. Joel B., 6020 St. Charles Ave.  
 Green, Mrs. Max M., 361 Bellaire Drive.  
 Guidry, Mrs. Edwin R., 720 Broadway.  
 Guillotte, Mrs. Wm., 123 S. Scott St.  
 Habeeb, Mrs. Albert F. E., 364 Jefferson Ave.,  
 Metairie.

Haik, Mrs. George, 7323 Burthe St.  
 Hanckes, Mrs. L. J., 43 Audubon Blvd.  
 Harms, Mrs. Herbert E., 6037 Prytania St.  
 Harris, Mrs. William H., 1325 S. Carrollton Ave.  
 Harris, Mrs. William, Jr., 101 F. Stadium Place.  
 Harrison, Mrs. Roy B., 2327 Napoleon Ave.  
 Hartwell, Mrs. Ralph M., 222 Labarre Rd., Metairie.

Hattaway, Mrs. M. M., 2814 State St.  
 Hauser, Mrs. George H., 3625 St. Claude Ave.  
 Hava, Mrs. Frank C., 506 Frenchmen St.  
 Hebert, Mrs. Aynaud, 2013 Napoleon Ave.  
 Hebert, Mrs. Warren, 70 Audubon Blvd.  
 Henington, Mrs. Medd, 5819 S. Galvez St.  
 Henry, Mrs. Richard, 4921 S. Prieur Place.  
 Henthorne, Mrs. J. C., 1445 Joseph St.  
 Herault, Mrs. Pierre C., 3126 La. Ave. Parkway.  
 Hines, Mrs. Merrell O., 501 Broadway.

(Gretna)

Hinderlang, Mrs. Floyd O., 805 Monroe St.

(New Orleans)

Holbrook, Mrs. Charles S., 1737 Calhoun St.  
 Holmes, Mrs. John A., 2437 Jefferson Ave.  
 Hopkins, Mrs. Jos. V., Jr., 800 N. Olympia St.

Horack, Mrs. Harold, 1519 Exposition Blvd.  
 Howles, Mrs. J. K., 1938 State St.  
 Hunt, Mrs. Norman, 1333 Webster St.  
 Hyman, Mrs. David, 4012 Vendome Place.  
 Jacobs, Mrs. Adolph, 2616 Napoleon Ave.  
 Jamison, Mrs. Chaille, 1524 Seventh St.  
 Jaubert, Mrs. Francis L., 5624 St. Charles Ave.  
 Johnson, Mrs. C. M., 1205 Jefferson Ave.  
 Johnson, Mrs. Max, 6017 Pasteur Blvd.  
 Johnson, Mrs. Philip B., 917 Navarre St.  
 Jones, Mrs. Charles A., VA Hospital.  
 Kagy, Mrs. Edwin, 2631 Calhoun St.  
 Kahle, Mrs. H. R., 1523 Pleasant St.  
 Kahle, Mrs. P. Jorda, 1525 Webster St.  
 Kaplan, Mrs. I. W., 1229 Second St.  
 Kaplan, Mrs. Murrel, 4601 S. Claiborne St.  
 Kelleher, Mrs. Robert C., 1462 State St.  
 Kirkpatrick, Mrs. Milton E., 1426 St. Andrew St.  
 Kittredge, Mrs. W. E., 5801 St. Charles Ave.  
 Klinger, Mrs. Morris, 2021 Jena St.  
 Knolle, Mrs. Wilkes, 4302 S. Roman St.  
 Kohlman, Mrs. William, 1330 Eleanore St.  
 Koelle, Mrs. Marcus, 1643 N. Claiborne Ave.  
 Kuhn, Mrs. Lloyd, 4317 S. Miro St.  
 Lacroix, Mrs. Paul G., 3132 State St.  
 LaNasa, Mrs. Joseph, 4031 Delgado Drive.

(Algiers)

Landry, Mrs. Durel, 115 Numa St.

(New Orleans)

Landry, Mrs. Jerome E., 2336 Milan St.  
 Lastrapes, Mrs. Paul B., 4459 Spain St.  
 Lawson, Mrs. Edwin H., 7610 Nelson St.  
 Leckert, Mrs. Edmund L., 1214 Nashville Ave.  
 Leggio, Mrs. Louis, 8300 Sycamore St.  
 LeJeune, Mrs. Francis E., 49 Audubon Blvd.  
 Lemann, Mrs. I. I., 6110 St. Charles Ave.  
 Letten, Mrs. A. H., 2301 Napoleon Ave.  
 Levert, Mrs. Edward L., 7714 Jeanette St.  
 Levy, Mrs. Louis, 25 Newcomb Blvd.  
 Little, Mrs. Edgar H., 500 Hector Ave.  
 Longacre, Mrs. Alfred B., 2319 Adams St.  
 Longo, Mrs. D. V., 2701 Octavia St.  
 Loomis, Mrs. L. K., 2239 Gen. Taylor St.  
 Lores, Mrs. Manuel C., 212 Maple Ridge Dr.  
 Lund, Mrs. Curtis J., 2235 Marengo St.  
 Lynch, Mrs. M. G., 2024 Audubon St.  
 Lynch, Mrs. Robert C., 1311 Webster St.  
 Lyons, Mrs. Champ, 1207 State St.  
 Lyons, Mrs. Marcy, 1735 Nashville Ave.  
 Lyons, Mrs. Morgan, 19 Newcomb Blvd.  
 Lyons, Mrs. Randolph, 19 Rosa Park.  
 Lyons, Mrs. Shirley, 2619 Octavia St.  
 Macdiarmid, Mrs. George, Pontchartrain Hotel.  
 Magee, Mrs. Henry C., 4024 Vincennes St.  
 Mahorner, Mrs. Howard R., 1730 Palmer Ave.  
 Maihles, Mrs. Roger, 7800 Nelson St.  
 Mallowitz, Mrs. M., 7333 Jeanette St.  
 Mancuso, Mrs. B. F., 2109 Alvar St.  
 Marek, Mrs. Frank H., 3201 Nashville Ave.  
 Marino, Mrs. Joseph B., 141 S. St. Patrick St.  
 Marino, Mrs. Frank X., 8432 Palmetto St.



Mattes, Mrs. A., 2419 Soniat St.  
 May, Mrs. C. P., 416 Lowerline St.  
 McComisky, Mrs. A. J., 4414 Galvez St.  
 McIlhenny, Mrs. Paul, 1313 Philip St.  
 McLean, Mrs. Lee D., 265 Bellaire Dr.  
 McNair, Mrs. S. B., 4725 Franklin Ave.  
 Meade, Mrs. Robert J., 8006 Sycamore St.  
 Medina, Mrs. I., Jr., 2 Virginia Court.  
 Mellinger, Mrs. George T., 4325 Jena St.  
 Menendez, Mrs. Joseph C., 4210 S. Broad St.  
 Menville, Mrs. Leon, 66 Fontainebleau Drive.  
 Meyer, Mrs. Monte F., 5525 S. Galvez St.  
 Miangolarra, Mrs. Charles, 813 Pere Marquette Bldg.  
 Michel, Mrs. M. L., 1591 Exposition Blvd.  
 Mickal, Mrs. Abe, 4834 Carondelet St.  
 Miller, Mrs. M. O., 24 Audubon Place.  
 Mogabgab, Mrs. Anees, 2 Versailles Blvd.  
 Montalbano, Mrs. N. C., 4773 Spain St.  
 Morris, Mrs. Harry D., 1430 Second St.  
 Monte, Mrs. Louis A., 3216 La. Ave. Parkway.  
 Moor, Mrs. Ruble, 1521 Amelia St.  
 Morrison, Mrs. Benjamin O., 508 St. Peter St.  
 Mundt, Mrs. L. K., 6303 Fontainebleau Dr.  
 Murphy, Mrs. Daniel J., 127 S. Solomon St.  
 Musser, Mrs. John H., 1129 Octavia St.  
 Mosely, Mrs. Kirk T., 3442 Vincennes Place.  
 Nabos, Mrs. John F., 3940 Touro St.  
 Nadler, Mrs. Sam B., 3039 Octavia St.  
 Nelson, Mrs. Edward W., 2224 Palmer Ave.  
 Nicholson, Mrs. Francis, 520 Jefferson Ave.  
 Nix, Mrs. Frank, 1516 Northline St.  
 Nix, Mrs. James T., 2140 S. Carrollton Ave.  
 Norman, Mrs. W. D., 3435 Upperline St.  
 Ochs, Mrs. Louis, 5700 St. Charles Ave.  
 Ochsner, Mrs. Albert II, 505 Pontchartrain Dr.  
 Odom, Mrs. Charles B., 7821 Belfast St.  
 O'Ferrall, Mrs. J. T., 1506 Louisiana Ave.  
 Oms, Mrs. Luis, 9405 Palm St.  
 Oser, Mrs. Frank, Jr., 8329 Palm St.  
 Owens, Mrs. Neal, 1806 Metairie Rd.  
 Parker, Mrs. J. Gray, 2416 Palmer Ave.  
 Parker, Mrs. J. S., 2701 Jefferson Ave.  
 Peacock, Mrs. Cassius L., 8415 S. Carrollton Ave.  
 Perret, Mrs. J. M., 1305 S. Carrollton Ave.  
 Phillips, Mrs. Ben, 3122 Jefferson Ave.  
 Phillips, Mrs. Percy A., 3113 La. Ave. Parkway.

## (Arabi)

Planche, Mrs. Felix A., 825 Friscoville Ave.

## (New Orleans)

Polmer, Mrs. Nathan, 2207 Carondelet St.  
 Popkin, Mrs. Hugo J., 4219 LaSalle St.  
 Prieto, Mrs. Alberto, 842 Broadway.  
 Rabin, Mrs. Herman, 2706 Soniat St.  
 Rateau, Mrs. Jules B., 6015 St. Charles Ave.  
 Reddock, Mrs. Jos. W., 62 Fontainebleau Dr.  
 Reed, Mrs. Kohlman, 2720 Octavia St.  
 Reed, Mrs. W. A., 2730 Octavia St.  
 Rein, Mrs. W. J., 3613 Napoleon Ave.  
 Renken, Mrs. Paul W., 21 Allard Blvd.  
 Riera, Mrs. R. B., 825 Broadway.

Rivenbark, Mrs. W. C., 5915 Coliseum St.  
 Robinson, Mrs. C. R., 2609 Nashville Ave.  
 Roeling, Mrs. George F., 3501 Napoleon Ave.  
 Roeling, Mrs. William, 4665 Franklin Ave.  
 Romano, Mrs. S. A., 1507 Dufossat St.  
 Rose, Mrs. Robert M., 8403 Stroelitz St.  
 Rosenthal, Mrs. Jonas W., 5355 St. Charles Ave.  
 Rosenthal, Mrs. Simon, 2632 Napoleon Ave.  
 Ross, Mrs. Raphael, Jr., 18 Oaklawn Drive.

## (New Orleans)

Rougelot, Mrs. Robert, Jr., 6368 Louis XIV St.  
 Roy, Mrs. William A., 7530 St. Charles Ave.  
 Russ, Mrs. J. D., 1404 Cadiz St.  
 Russell, Mrs. Howard, 1674 Jefferson Ave.  
 Salatch, Mrs. Blaise, 2312 Napoleon Ave.  
 Saleeby, Mrs. J. P., 710 Belleville St.  
 Sanders, Mrs. John, 6100 St. Charles Ave.  
 Schlesinger, Mrs. Lee C., 10 Newcomb Blvd.  
 Schneider, Mrs. George T., 49 Audubon Blvd.  
 Scott, Mrs. Jos. T., Sr., 1641 State St.  
 Scott, Mrs. Jos. T., Jr., 3429 Octavia St.  
 Seebold, Mrs. Herman, 2504 Prytania St.  
 Seeman, Mrs. William, 1577 Henry Clay Ave.  
 Segal, Mrs. Allan, 3132 State St. Drive.  
 Sellers, Mrs. T. B., 1442 Nashville Ave.  
 Sharp, Mrs. Robert, 46 Farnham Place, Metairie.  
 Silverman, Mrs. Dan N., 47 Versailles Blvd.  
 Simmons, Mrs. R. L., 33 Fontainebleau Drive.  
 Simon, Mrs. Sidney K., 465 Audubon Blvd.  
 Simon, Mrs. Theodore, 1300 Third St.  
 Smith, Mrs. Earl Conway, 3426 Upperline St.  
 Smith, Mrs. George L., 1308 Broadway.  
 Smith, Mrs. Victor C., 2016 Calhoun St.  
 Smyth, Mrs. John, 7 Richmond Place.  
 Socola, Mrs. Edwin, 1219 Broadway.  
 Sodeman, Mrs. W. A., 2037 General Taylor St.  
 Soniat, Mrs. Theo. L., 2807 Calhoun St.  
 Souchon, Mrs. Edmond, 3126 Octavia St.  
 Souchon, Mrs. Marion, 3530 Octavia St.  
 Spizer, Mrs. David, 4705 Mandeville St.  
 Steele, Mrs. C. H., 2920 Bore St.  
 Stern, Mrs. Sol, 624 Broadway.  
 St. Martin, Mrs. Maurice, 1920 Audubon St.  
 Stone, Mrs. J. Kelly, 72 Fontainebleau Drive.  
 St. Romain, Mrs. Murphy J., Jr., 5509 Cameron Blvd.  
 Strange, Mrs. Jack, 350 Vincent Ave.  
 Sustendal, Mrs. George F., 1128 Nashville Ave.  
 Tanner, Mrs. John, 8313 Panola St.  
 Taquino, Mrs. George, 18 Fontainebleau Drive.  
 Tedesco, Mrs. Ignatius, Jr., 3435 Metairie Road, Metairie.  
 Tedesco, Mrs. Victor, 3732 Canal St.  
 Teitelbaum, Mrs. M. D., 1543 Exposition Blvd.  
 Tessitore, Mrs. N. J., 3934 Canal St.  
 Thiberge, Mrs. N. F., 497 Walnut St.  
 Thomas, Mrs. E. Perry, 1331 Philip St.  
 Thomas, Mrs. H. Ashton, 5968 Canal Blvd.  
 Tiblier, Mrs. Sidney L., Jr., 1220 N. Lopez St.  
 Tiller, Mrs. Philip, Jr., 3621 Prytania St.  
 Tomskey, Mrs. Gilbert, 1539 Philip St.  
 Treadway, Mrs. James L., 3832 Cambronne St.

Tuman, Mrs. Walter C., 3227 State St. Drive.  
 Unsworth, Mrs. H. R., 1215 Seventh St.  
 VanStuddiford, Mrs. M. T., 538 St. Peter St.  
 Vella, Mrs. Joseph, 1221 Henry Clay Ave.  
 Vickery, Mrs. Eugene, 1220 Jefferson Ave.  
 Vickery, Mrs. George, 4922 Baronne St.  
 Vincent, Mrs. Richard, 1237 Jackson Ave.  
 Voorhies, Mrs. Norton, 636 Pine St.  
 Wagner, Mrs. William, 7030 Canal Blvd.  
 Wahl, Mrs. Carl N., 6317 Barret St.  
 Walls, Mrs. Garland, 1645 Soniat St.  
 Walters, Mrs. Charles, 74 Neron Place.  
 Ward, Mrs. Simon, 1442 Nashville Ave.  
 Warren, Mrs. J. W., 490 Audubon Blvd.  
 Watters, Mrs. Theodore, 1508 Pine St.  
 Webb, Mrs. James S., 721 Burdette St.  
 Weed, Mrs. John P., 816 Burdette St.  
 Weil, Mrs. Arthur, 6 Cromwell Place.  
 Weil, Mrs. James S., Jr., 721 Burdette St.  
 Weilbaecher, Mrs. J. O., Jr., 5826 Clara St.  
 Weinberger, Mrs. Herbert, 4108 Vendome Place.  
 Weinstein, Mrs. B. B., 1316 Broadway.  
 Wells, Mrs. Joe, 2326 Jefferson Ave.  
 White, Mrs. J. Arthur, Jr., 30 Farnham Place.  
 Wicher, Mrs. Celeste G., 315 S. Olympia St.  
 Wild, Mrs. F. A., 8117 Freret St.  
 Wilson, Mrs. Julius, 3001 Coliseum St.  
 Wirth, Mrs. Willard, 402 Vincent Ave.  
 Young, Mrs. Thomas L., 8231 Plum St.  
 Zander, Mrs. Edwin L., 1148 City Park Ave.  
 Zengel, Mrs. Harry L., Jr., 8418 Palmetto St.  
 Zurik, Mrs. Samuel, 7740 Belfast St.

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 Diaz, Mrs. Joseph A., 1427 ½ Louisiana Ave.  
 Faust, Mrs. Ernest Carroll, 2628 Octavia St.  
 Graffagnino, Mrs. Peter C., 1434 Amelia St.  
 Grosjean, Mrs. Sam B., 6223 LaSalle St.  
 Healy, Mrs. William J., 2717 Octavia St.  
 Jacobs, Mrs. Warren M., 3621 Cambronne St.  
 Levy, Mrs. Leopold, 4208 Vendome Place.  
 Mary, Mrs. Amedee, 179 Bellaire Dr.  
 Morgan, Mrs. Stanley E., 1732 Gentilly Road.  
 Schoeny, Mrs. Leo J., 27 Versailles Blvd.  
 Signorelli, Mrs. Anita, 3228 Canal St.  
 Tiblier, Mrs. Sidney I., 639 Broadway.  
 Wahl, Mrs. J. P., 236 Audubon Blvd.  
 Williams, Mrs. O. C., U. S. Marine Hospital.  
 Wolfe, Mrs. Frederick J., 5825 Fontainebleau Dr.

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 Lindner, Mrs. John W., 915 Bourbon St.

Oriol, Mrs. Raymond, 5215 S. Derbigny St.  
 Silber, Mrs. Mendel, 1735 General Pershing St.

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(Monroe)

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 Bendel, Mrs. W. L., 1200 North Third.  
 Bennett, Mrs. F. C., 301 K Street.  
 Brin, Mrs. A. R.

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Calvert, Mrs. E. G., 109 Cypress.

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 Collins, Mrs. H. V., 1413 North Third.  
 Cookston, Mrs. W. C., Jr.  
 Coon, Mrs. Henson S.  
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 Cutler, Mrs. Hayden, 624 Loop Road.  
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(Monroe)

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 Gray, Mrs. C. P., Jr., 1200 Fairview.  
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 Hamilton, Mrs. A. S., 1300 Island Drive.  
 Hammonds, Mrs. F. H.  
 Hill, Mrs. C. H., 1617 Park Avenue.  
 Hirsch, Mrs. D. I., 301 Hudson Land.  
 Hunter, Mrs. M. W., Loop Road.  
 Johnson, Mrs. C. U., 504 Forsythe.  
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 Lobrano, Mrs. C. M., 2808 Gordon.  
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 McHenry, Mrs. A. G., 1810 Riverside.  
 McHenry, Mrs. M. A., 1000 Jackson.  
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 Mintz, Mrs. Stanley.  
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 Murphey, Mrs. J. W., 1012 Jackson.  
 Perot, Mrs. P. L., 1405 Park Avenue.  
 Peters, Mrs. A. L., Edgewaters Gardens.  
 Pracher, Mrs. John, 1403 Emerson.  
 Rizzo, Mrs. F. P., 1111 North Fourth.  
 Sampognaro, Mrs. V. J., 3402 DeSiard.  
 Schonlau, Mrs. J. W., 1800 North Fifth.  
 Shlenker, Mrs. L. L., 504 Hilton.  
 Simonton, Mrs. R. M., 702 Hilton.  
 Snelling, Mrs. J. G., 2101 Marie.

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 Summer, Mrs. W. C., 1614 Jackson.  
 Talbot, Mrs. Ralph, 200 Arkansas.  
 Tisdale, Mrs. A. D., 2924 Gordon.  
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 Webster, Mrs. W. H., 1700 North Second.  
 Wilds, Mrs. C. E., Jr., 112 Glenmar.  
 Willey, Mrs. F. J.  
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 Causey, Mrs. Wren, Monroe.  
 Pankey, Mrs. J. H., Ferriday.  
 Rogers, Mrs. H. T., Winnsboro.  
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 Mosely, Mrs. John M., New Roads.  
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 Aderhold, Mrs. Wallace.  
 Antony, Mrs. S. O., 1931 Vance.

## (Pineville)

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## (Alexandria)

Barker, Mrs. H. O., Horseshoe Drive.

## (Lecompte)

Blake, Mrs. B. C.

## (Alexandria)

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 Calhoun, Mrs. S. L., 2241 Thornton Court.  
 Cappel, Mrs. J. T., 1741 Thornton Court.  
 Chicola, Mrs. V. F., 1710 Stanford.

## (Pineville)

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 Forsyth, Mrs. H. P., 2010 Jackson.  
 Foster, Mrs. M. H., 2107 Albert.

## (Pineville)

Foster, Mrs. R. H., Central Louisiana Hospital Grounds.

## (Alexandria)

Freedman, Mrs. R. J.

## (Pineville)

Freeman, Mrs. M. S., Central Louisiana Hospital Grounds.

## (Alexandria)

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 Gahagan, Mrs. H. Q.  
 Gancy, Mrs. E. R., 1937 Jackson.  
 Gremillion, Mrs. L. D., 2038 Albert.

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 Hensel, Mrs. A. E.  
 Herrington, Mrs. C. P., 2510 Avenue A.  
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 Jones, Mrs. Earl, 631 Jackson.  
 Kingsley, Mrs. D. M., 2779 Hill.  
 Klamke, Mrs. E. G.  
 Lampert, Mrs. Ralph, Park Place Drive.  
 Landrum, Mrs. J. H., 2203 White.

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 McBride, Mrs. Wm., 1836 Albert.  
 Miller, Mrs. R. E. C., 1732 White.  
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 Packer, Mrs. J. M., 1776 Jackson.  
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 Simmonds, Mrs. Noel.  
 Smith, Mrs. G. W., 1936 Thornton Court.  
 Texada, Mrs. B. H., 1740 White.  
 Uhrich, Mrs. E. C., 2327 Vance.  
 Wallace, Mrs. R. B., Jr., 607 20th Street.

(Pineville)

Welch, Mrs. James, Central Hospital Grounds.

(Alexandria)

Welch, Mrs. J. W., 529 Park Place Drive.

White, Mrs. H. A., 2613 Vance.

White, Mrs. J. A., Jr., 1814 Marye.

Willis, Mrs. J. T.

Wilson, Mrs. E. D.

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Chambers, Mrs. H. C., Rayville.

Durham, Mrs. G. W., Rayville.

Sayre, Mrs. T. M., Rayville.

Teer, Mrs. Lorenz, Delhi.

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#### SABINE PARISH

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Lester, Mrs. W. D., Many.

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Price, Mrs. W. N., Jr., Many.

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Jenkins, Mrs. Harry, Eunice.

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#### ST. TAMMANY PARISH

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(Covington)

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Gautreaux, Mrs. H. E., 1914 Virginia.

Healy, Mrs. T. H., 23rd Avenue.

Warren, Mrs. B. B., 621 Rutland.

Young, Mrs. Roy Carl, 1811 Jahneke Avenue.

#### TANGIPAHOA PARISH

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Cali, Mrs. S. J., Hammond.

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Feder, Mrs. A. J., Hammond.

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Lipscomb, Mrs. C. P., Ponchatoula.

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Ellender, Mrs. Rudolph, Gabasse Street, Houma.

Ellender, Mrs. S. Ernest, Crescent Boulevard,  
Houma.

Ellender, Mrs. Willard A., Bayou Black Route,  
Houma.

Houston, Mrs. Matt F., 709 Barrow Street, Houma.

Landry, Mrs. Saul F., Bayou Black Drive, Houma.

St. Martin, Mrs. Roy, Morningside, Houma.

St. Martin, Mrs. T. I., West Park Avenue, Houma.

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(Unorganized)

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Cook, Mrs. E. B., Downs ville.

Edwards, Mrs. A. M., Farmerville.

Norris, Mrs. John G., Farmerville.

Ramsey, Mrs. George A., Farmerville.

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(Unorganized)

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Gardiner, Mrs. G. L., Jr., Gueydan.

Latiolais, Mrs. Thomas, Kaplan.

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ville.

Broyles, Mrs. J. E., 1301 Aaron, Leesville.

Byrd, Mrs. E. H., 1305 Texas St., Leesville.

Johnson, Mrs. W. M., 804 Dennis Ave., Leesville.

Reid, Mrs. W. E., 800 West Third, Leesville.

Shaw, Mrs. Edgar Molloy, 1501 Texas St., Lees-  
ville.

Talbot, Mrs. Milton Wm., 1001 Fifth St., Leesville.

Younger, Mrs. J. B., Younger Hospital, Kurthwood.

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 Morgan, Mrs. H. L., Bogalusa.  
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 Pepe, Mrs. John L., Bogalusa.  
 Stafford, Mrs. H. A., Franklinton.

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 Garrett, Mrs. J. M., Cotton Valley.  
 Garrett, Mrs. W. R., Springhill.  
 Gray, Mrs. W. C., Springhill.  
 Mims, Mrs. D. D., Minden.  
 Richardson, Mrs. S. M., Jr., Minden.  
 Sentell, Mrs. C. S., Minden.  
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 Everett, Mrs. William, Oak Grove.  
 Jarrell, Mrs. C. M., Epps.

**WEST FELICIANA PARISH**  
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**WINN PARISH**  
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 Martin, Mrs. Roy V., Winnfield.  
 Mosley, Mrs. John T., Winnfield.  
 Watson, Mrs. Arthur, Winnfield.  
 Wright, Mrs. Roy Wm., Winnfield.

**SECOND DISTRICT**

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Campbell, Mrs. Steve, Hymel.

(New Orleans)

Cashio, Mrs. Paul, 4429 Jefferson Highway.  
 Casteix, Mrs. M., Box 193, Kenner.  
 Clayton, Mrs. J. E., Norco.  
 Donaldson, Mrs. P. A., Reserve.  
 Fernandez, Mrs. J. R., Wallace.  
 Gelbke, Mrs. C. F., Gretna.  
 Gidman, Mrs. P. T., Harvey.  
 Godchaux, Mrs. P. M., Reserve.  
 Gregoratti, Mrs. J. V., Gretna.  
 Gros, Mrs. Remy, Laplace.  
 Johnson, Mrs. A. Z., 418 Metairie Road, New Orleans.

Johnson, Mrs. Paul, Lutchet.  
 Kirn, Mrs. J. D., Luling.  
 Kopfler, Mrs. J. S., Kenner.  
 Labruyere, Mrs. P. P., 4480 Fourth, Marrero.  
 Landry, Mrs. P. T., Norco.  
 Massony, Mrs. A. A., Westwego.  
 Massony, Mrs. J. J., Westwego.  
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 Trigg, Mrs. Dan, Reserve.  
 Troxler, Mrs. F. A., Lafitte.  
 Wild, Mrs. Fred, Destrehan.

**WOMAN'S AUXILIARY TO THE LOUISIANA  
 ACADEMY OF GENERAL PRACTICE**

This is a new venture in the auxiliary life of Louisiana and is intended to bring about closer social ties with the wives of doctors who practice in this field of medicine. As the roster is reviewed it will be noted that most of the members are active in the parish, state and national auxiliaries, many of them rendering valuable service. They are welcomed as a new group and are extended good wishes for a high degree of success.

**WOMAN'S AUXILIARY TO THE LOUISIANA  
 ACADEMY OF GENERAL PRACTICE**

Mrs. Dorman B. Barber, President.

Pineville, Louisiana.

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Mrs. Bruno F. Mancuso, New Orleans, Louisiana.

Blandino, Mrs. V. P., 5400 Gen. Diaz St., New Orleans.

Burger, Mrs. O. J., 2036 Palmer Ave., New Orleans.

Cabibi, Mrs. C. P., 3027 Paris Ave., New Orleans.

Cabiran, Mrs. Louis R., 5902 Dauphine St., New Orleans.

Chetta, Mrs. N. J., 70 Fontainebleau Dr., New Orleans.

Ciolino, Mrs. Jos., 4486 St. Roch St., New Orleans.

Danton, Mrs. B. F., Jr., 2301 Tennessee St., New Orleans.

Fatter, Mrs. Esmond A., 3421 Canal St., New Orleans.

Feldner, Mrs. George D., 3814 Louisiana Ave. Pky., New Orleans.

Furlow, Mrs. T. E., Jr., 6210 Franklin Ave., New Orleans.

Gehbauer, Mrs. Louis J., 2723 Odin St., New Orleans.

Gillaspie, Mrs. R. E., 2722 Broadway, New Orleans.

Gillaspie, Mrs. W. S., 35 Versailles Blvd., New Orleans.

Guidry, Mrs. Edwin R., 720 Broadway, New Orleans.  
 Hyman, Mrs. David, 4012 Vendome Place, New Orleans.  
 Johnson, Mrs. A. E., 3130 Elysian Fields, New Orleans.  
 Jung, Mrs. T. A., 1219 Rendon, New Orleans.  
 Kirn, Mrs. Theo F., 4744 Franklin Ave., New Orleans.  
 LaNasa, Mrs. Philip P., 2425 Esplanade Ave., New Orleans.  
 Mancuso, Mrs. B. F., 2109 Alvar St., New Orleans.  
 Medina, Mrs. I., 2 Virginia Court, New Orleans.  
 Menendez, Mrs. J. C., 4210 S. Broad St., New Orleans.  
 Murphy, Mrs. D. J., 127 S. Solomon St., New Orleans.  
 Parker, Dr. Alma M., 2701 Jefferson Ave., New Orleans.  
 Pitkin, Mrs. A. B., 3439 Prytania St., New Orleans.  
 Rateau, Mrs. J. B., 6015 St. Charles Ave., New Orleans.  
 Robinson, Mrs. C. R., 407 Marine Bldg., New Orleans.  
 St. Romain, Mrs. M. J., Jr., 3831 Frenchmen St., New Orleans.  
 Saleeby, Mrs. Philip J., Box 6029, New Orleans.  
 Strange, Mrs. W. R., 5719 Clara St., New Orleans.  
 Tardo, Mrs. C. J., 2209 Broadway, New Orleans.  
 Trist, Mrs. N. P., 948 Friscoville, Arabi.  
 Wheeler, Mrs. C. J., 3800 Piedmont Dr., New Orleans.  
 White, Mrs. J. A., Jr., 30 Farnham Place, Metairie.

## SECOND DISTRICT:

### Councilor:

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 Clayton, Mrs. J. Earle, Norco.  
 Donaldson, Mrs. Pierre A., Reserve.  
 Gauthier, Mrs. W. K., 208 Sycamore Dr., Metairie.  
 Gelbke, Mrs. C. F., 8 Willow Dr., Gretna.  
 Gray, Mrs. J. B., 6020 St. Charles Ave., New Orleans.  
 Hindelang, Mrs. F. M., 905 Monroe, Gretna.  
 Kopfler, Mrs. J. S., Kenner, Louisiana.  
 LaBruyere, Mrs. P. P., Marrero.  
 Massony, Mrs. J. J., Westwego.  
 Wild, Mrs. F. A., Jr., Destrehan.

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### Councilor:

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 Bourgeois, Mrs. R. L., 518 Brooks St., Lafayette.  
 Dalton, Mrs. O. E., New Iberia.  
 Davis, Mrs. F. H., 403 Myrtle Place, Lafayette.  
 Duhon, Mrs. J. O., 211 Cherry St., Lafayette.  
 Flory, Mrs. H. M., New Iberia.  
 Gonzales-Romo, Mrs. B., Jeanerette.  
 Hamilton, Mrs. Chas. E., 1124 St. John St., Lafayette.

Horton, Mrs. Chas. M., Franklin, Louisiana.  
 Jones, Mrs. G. R., Lockport.  
 Kurzweg, Mrs. P. H., Jr., Lafayette.  
 Melancon, Mrs. William, Carencro.  
 Prejean, Mrs. L. A., Scott.  
 Robichaux, Mrs. P. A., Raceland.  
 Robichaux, Mrs. R. E., Raceland.  
 Sonnier, Mrs. Wm., Jr., Franklin.  
 Voohries, Mrs. H. C., Jr., 312 Dunreath St., Lafayette.

## FOURTH DISTRICT:

### Councilor:

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 Bodenheimer, Mrs. J. M., 815 Delaware, Shreveport.  
 Clark, Mrs. A. I., 614 Med. Arts Bldg., Shreveport.  
 Cohenour, Mrs. H. L., 715 Longleaf Dr., Shreveport.  
 Cook, Mrs. Byron L., Minden.  
 Curtis, Mrs. H. P., Mansfield.  
 Gill, Mrs. S. L., 1046 Kingshighway, Shreveport.  
 Hill, Mrs. W. J., Jr., 725 Erie St., Shreveport.  
 Hilton, Mrs. E. T., 104 Physicians & Surgeons Bldg., Shreveport.  
 Huckabay, Mrs. L. S., Coushatta.  
 Landry, Mrs. L. V., 113 Bobbie St., Bossier City.  
 Pou, Mrs. J. G., 1030 Kingshighway, Shreveport.  
 Richardson, Mrs. T. A., Minden.  
 Sanders, Mrs. J. P., 3218 Line Ave., Shreveport.

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### Councilor:

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 Allen, Mrs. Dean H., Tallulah.  
 Bostick, Mrs. John N., Gilbert.  
 Carrierre, Mrs. S., Jr., Winnsboro.  
 Carroll, Mrs. E. L., Columbia.  
 Mangham, Mrs. A. D., Clarks.  
 Rogers, Mrs. Hollis T., Winnsboro.  
 Teer, Mrs. Lorenz, Delhi.  
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White, Mrs. James A., Jr., 1740 Jackson St., Alexandria.

### WOMAN'S AUXILIARY TO THE LOUISIANA ACADEMY OF GENERAL PRACTICE

While it is a matter of commonplace knowledge that after the eventful first step, the human infant can be relied upon to put the other foot forward with increasing regularity, the similarity does not extend to infant organizations. The Woman's Auxiliary to the Louisiana Academy of General Practice extended itself beyond its own wildest dreams at the first annual convention which made history in women's organizational circles. Now, due to reorganizational plans on a national scale, the group is faced with its second convention plans in a half year span.

December 11 and 12 have been set for the dates of the Alexandria meeting. Each auxiliary member is not only urged to accompany her husband, but to persuade at least one member of her professional community to qualify as a member so that his wife may also participate in auxiliary activities.

Since the auxiliary was founded on a keynote of purely social objectives, it has already become the custom for fast friendships to be formed while committee members are planning festivities. Our husbands have long had the opportunity of meeting kindred souls who share their problems and frustrations. We women are discovering compensations and privileges in our treasured positions as wives of general practitioners.

Active Mrs. Barber, president of the Louisiana group of women (the foremost in the nation) found time to attend a meeting of the sixth district group at a center just outside of Hammond. She outlined the efforts the Louisiana women had made to establish a national auxiliary at this time, and explained why a negative vote of the nation's board of the American Academy of General Practice, then meeting in Kansas City, did not mean that a national group was being frowned upon. It has been decided that it was better to have the majority of the states organize women's groups first, so that national ideals and activities may become more crystallized.

Mrs. Barber is calling a meeting of her board coincidentally with the board meeting of the men's group on November 6 at Alexandria. It is to be hoped that she will have a full attendance to help her plan her schedule for the coming year, and approve the convention committee's engagements as lined up for December 11 and 12.

Sixth district is to be heartily commended, not only for the excellency of its program on September 28, but for the interest which drew members from as far away as Alexandria, Shreveport and New Orleans. In addition to the scientific program of the afternoon, Dean John Francis McCloskey of the school of pharmacy of Loyola University, spoke to the doctor-wife dinner group on a subject of mutual interest, "Government Controls", with emphasis on the proposed Truman program of federalized medicine.

After dinner the groups diverged into meetings of separate concerns, and eleven o'clock found the far-from-home loath to leave.

If for nothing else, Hammond will long be remembered as the home of the first president of the first Woman's Auxiliary to a group of the American Academy of General Practice, and it was entirely fitting that this group be entertained by Mrs. Wiginton at her lovely home.

During the afternoon, there was informal discussion in relation to the St. Louis meeting in February. We are even expecting to charter space on several pullmans for the Louisiana group.

Come join us some time. Any member is welcome at any district meeting, and all districts are enjoined to notify the state publicity chairman of impending meetings or past news of interest.

Mazie Adkins Guidry,  
Chairman of Publicity.

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### THE USE OF ANTICOAGULANTS IN THE TREATMENT AND PREVENTION OF CORONARY ARTERY DISEASE AND MYOCARDIAL INFARCTION\*

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MIAMI, FLORIDA

#### RATIONALE

The use of dicumarol and heparin in acute coronary thrombosis and myocardial infarction, in order to reduce both mortality and morbidity, is gaining favor. Recent carefully conducted studies by Blumgart and co-workers<sup>1</sup>, and LeRoy and Nalefski<sup>2</sup> successfully demonstrate that the use of dicumarol in dogs in which coronary occlusion has been produced does not increase the tendency to hemorrhage in the infarcted myocardium, neither does it alter the size of the infarct, nor produce any other deleterious effect on the myocardium. In both treated dogs and controls no mural thrombi were found. Beattie and co-workers<sup>3</sup> had previously conducted similar experiments in dogs and found no differences in the gross or histological pathologic findings in the dicumarolized group compared with the control animals. They stated hemorrhage was not a prominent feature in either group of animals, and concluded there was no evidence that dicumarol had a favorable effect on experimental myocardial infarction. These studies, conducted by independent investigating groups serve to allay the fear of rendering the infarct excessively

hemorrhagic or extending its size when anticoagulants are employed in patients with acute myocardial infarction.

The following objectives obtain in using anticoagulants in acute myocardial infarction:

1. Prevention of propagation of the initial coronary thrombosis with subsequent increase in the size of the infarct.
2. Prevention of a complicating new coronary thrombosis and/or myocardial infarction during the healing stage of the initial attack.
3. Prevention of intracardiac mural thrombi, with subsequent peripheral embolization from the left side of the heart, to the brain, kidney, spleen, mesentery, extremities, or even a coronary branch, and avoiding those pulmonary emboli which derive from the right cardiac chambers.
4. Prevention of phlebothrombosis in the leg veins, the prime source of subsequent pulmonary emboli.
5. Prevention of concomitant arterial thrombosis in the brain, lungs, abdominal organs, and extremities.

During the acute attack, the enforced bed rest and fall in blood pressure contribute to the likelihood of thrombo-embolization. If congestive heart failure ensues, thrombo-embolic lesions are fostered by the pathophysiology as well as by the usual treatment for heart failure.

Bean<sup>4</sup> found in 300 autopsied cases of myocardial infarction that embolism was a significant factor in causing death in 26 per cent. In 100 cases of acute myocardial infarction studied by Nay and Barnes<sup>5</sup> vascular complications were found in 37 per

\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 6, 1949.



cent. Hellerstein and Martin<sup>6</sup> report 45 per cent incidence of thrombo-embolism in 160 autopsied cases of myocardial infarction. Ogura and associates<sup>7</sup> found peripheral thrombo-embolic phenomena in 45 per cent of 100 cases of myocardial infarction at autopsy, with proximal extension of the coronary thrombosis in 12 per cent and additional coronary thrombosis in 19 per cent of the cases. Mintz and Katz<sup>8</sup> reported that 9.9 per cent of 572 patients with acute myocardial infarction had clinical thrombo-embolic lesions. Foord<sup>9</sup> found mural thrombi in 40 per cent and embolic lesions in 25 per cent of 442 cases of autopsy in which there was old or recent cardiac infarction, and he mentions unpublished data of Edmondson revealing 328 thrombo-embolic manifestations in 1,000 cases of acute myocardial infarction. A compilation of reports on 924 cases of myocardial infarction by Hellerstein and Martin<sup>6</sup> augmented by the data of Ogura<sup>7</sup> and Foord<sup>9</sup>, reveals mural (intracardiac) thrombi were manifest at autopsy in nearly 45 per cent of 1466 cases. Recently Adams and Cohen<sup>10</sup> found myocardial infarction to be the third commonest cause of cerebral embolism in a study of 120 cases of cerebrovascular lesions at autopsy.

Bean<sup>11</sup> found that myocardial infarction developed in 20 per cent of cases as a consequence of organic narrowing of the coronary artery without thrombosis. Commenting on this, and the fact that coronary thrombosis may be initiated by intimal hemorrhage in a coronary artery, he states: "Where these mechanisms prevail a reduction of coagulability of the blood would be ineffective and might even be dangerous." The fear that anticoagulants might induce coronary artery intimal hemorrhage and thus aggravate or initiate coronary thrombosis has been quieted by the failure to discover any significant degree of coronary subintimal hemorrhage at autopsy in cases treated with anticoagulants, both in the study of 90 autopsied cases by the American Heart Association Committee, and in 20 autopsies in my own acute infarction series and long-term "coronary" cases, in

whom careful histologic studies of the myocardium and coronary vessels were made by Dr. Philip Rezek.\* As for the use of anticoagulants in those myocardial infarcts not caused by coronary thrombosis, such an infarct is just as likely to be complicated by mural thrombosis and subsequent peripheral thrombo-embolism as is the case with myocardial infarction caused by coronary occlusion.

To ward off propagation of the coronary thrombus and to prevent secondary thrombosis or infarction during the lag period of dicumarol, heparin is given the first few days and to prevent mural thrombi as well, although pathologic studies indicate that mural thrombi seldom form until the fourth day after myocardial infarction. Heparin in retarding media may be used throughout the four to six weeks of the acute episode, as advocated by Loewe<sup>12</sup> without recourse to dicumarol.

#### RESULTS OF TREATMENT OF ACUTE MYOCARDIAL INFARCTION

The efficacy of the treatment of acute coronary thrombosis and/or acute myocardial infarction with anticoagulants has descended from the realm of speculation to the firm ground of statistical proof following the laborious and splendid compilation by Wright, Marple and Beck<sup>13</sup> of the results of the cooperative study by the American Heart Association Committee for the Evaluation of Anticoagulants in the Treatment of Coronary Thrombosis with Myocardial Infarction. The final report of this committee has not been published but the augmented data in 589 "treated" cases compared to a "control" group of 442 cases reveals the mortality rate in the treated group was 16 per cent compared to 23.4 per cent in the control group; while in the treated group 10.9 per cent developed thrombo-embolic complications compared to 26 per cent in the control group.

Since June 1943, up to May, 1949, I have used anticoagulants in 160 patients in 166 attacks of acute myocardial infarction, excluding ward cases incorporated in the American Heart Association Committee

\*Pathologist, Jackson Memorial Hospital, Miami, Florida.

study. The results in 68 attacks have been reported,<sup>14</sup> while the mean death rate in all

TABLE I

AUTHOR'S CASES OF ACUTE CORONARY THROMBOSIS TREATED WITH ANTICOAGULANTS,  
JUNE 1943-MAY 1949

	Number	Deaths
1st Attacks	99	6
2nd "	59	15
3rd "	7	1
4th "	1	1
160 Patients	166 Attacks	23 (13.8%)
Autopsies	14 Thrombo-embolism	4
Mural thrombi	2 Subepicardial hemorrhage	3
Major hemorrhage	16 Cardiac rupture	1

attacks was 13.2 per cent (Table I), the mortality rate in 99 first attacks was 6 per cent and in patients with one or more previous attacks was 25.3 per cent. Furman<sup>15</sup> and co-workers recently stated that in 82 patients with myocardial infarction receiving anticoagulants the reduction in mortality was primarily in first attacks.

Only 4 patients developed thrombo-embolic complications while taking anticoagulants. In one case there was inconclusive clinical evidence of pulmonary embolism, and in another although autopsy disclosed mesenteric embolism, this apparently derived from an aortic atheromatous plaque as no intracardiac thrombi were found. A third case with extensive infarction dying with congestive failure after four weeks had a small mural thrombus and bilateral renal emboli at autopsy. A fourth case with old and recent myocardial infarction was started on heparin which was discontinued because of hematemesis. Two weeks later pulmonary embolization developed so heparin was used again without further bleeding. Ventricular tachycardia developed followed by femoral embolism and then cerebral embolism, both clearing clinically when heparin was augmented. Death later ensued from congestive failure and autopsy showed extensive cardiac infarction with mural thrombosis.

Microscopic sections of the myocardium in 14 autopsied cases did not reveal any significant adverse effects attributable to use of anticoagulants, except for hemorrhage between the media and adventitia in one

coronary artery branch, mild subendocardial hemorrhage in 3 cases, 1 of which also showed hemorrhage within the infarcted myocardium. No toxic effects were found in the liver and kidneys.

Major hemorrhagic complications, chiefly gross hematuria, developed in 10 per cent of this series. There were no deaths definitely due to hemorrhage, although 1 case not autopsied may have had a cerebrovascular accident, and 1 patient who developed ventricular rupture of course had hemopericardium.

TABLE II

MORTALITY IN ACUTE CORONARY THROMBOSIS AND MYOCARDIAL INFARCTION TREATED WITH ANTICOAGULANTS  
JUNE 1943-MAY 1949

Author	Number of	
	Cases	Deaths
Nichol	166*	23
Peters et al	110	12
Wright	76	15
Parker-Barker	100	11
Fuller	34	5
Reich-Eisenmenger	24	4
McCall	71	9
Greisman-Marcus	75	7
Total	656	86 or 13.1%

\*Reports exclusive of Am. Heart Ass'n. Study so data of Glueck et al, Van der Veer-Marshall, omitted.

\*98 added to previous reports of author.

Table II summarizes the results in 656 "treated" cases reported to date *not* incorporated in the cooperative Committee study. The mortality rate averaged 13.1 per cent; whereas in 2,325 cases of acute myocardial infarction, not given anticoagulants, recorded in the literature since 1940 the mean mortality was 28.8 per cent (Table III). Table IV shows the low incidence of thrombo-embolic complications, mural thrombi, and ventricular rupture in the treated groups.

#### DISCUSSION

It is with astonishment one hears Murray<sup>16</sup> recently remark, anent acute myocardial infarction, "medical treatment is so ineffective, and is entirely helpless, except from a palliative point of view" especially as Murray pioneered in the use of heparin



TABLE III

IMMEDIATE MORTALITY MYOCARDIAL INFARCTION  
REPORTS SINCE 1940

Author	Cases	Death %
Rosenbaum-Levine	208	33
Bland-White	86	44
Rathe	274	20
Smith et al	100	15
Woods-Barnes	128	46
Shillito et al	50	34
Nay-Barnes	100	13
Baer-Frankel	378	39
Peters et al	86	25
Fisher-Zukerman	108	33
Chambers	100	34
Fuller	35	28
Mintz-Katz	572	21
Greisman-Marcus	100	35
Total	2,325	28.8%

in surgical cases.

Parker and Barker<sup>17</sup> recently commented: "Intravenous injections and daily venepunctures are not to be considered lightly in the management of patients with acute myocardial infarction, when complete rest, freedom from apprehension and the avoidance of unessential therapeutic and diagnostic procedures have long been accepted as imperative. To justify its use, one must certainly show sufficient value in any diagnostic or therapeutic procedure which is mentally or physically disturbing to the patient."

Since increase in hemorrhage and softening of the myocardial infarcted area with consequent rupture was one of the dire consequences commonly predicted would follow the use of anticoagulant therapy, it is of no little interest that in the American Heart Association study only a few cases had myocardial rupture, and it will be seen in Table IV that only 5 cases were discovered at autopsy in 580 treated cases. Thus the incidence of cardiac rupture was much lower than the 4 to 6 per cent rate commonly reported. It might be postulated that there is less abrupt infarction, with improved collateral blood flow, and less necrosis in the infarcted area resulting in less loss of tensile strength of the myocardium, all of which factors enter into the pathogenesis of cardiac rupture.

Comparison of the death rate in un-

TABLE IV

INCIDENCE OF THROMBO-EMBOLIC COMPLICATIONS  
IN 580 CASES CORONARY THROMBOSIS TREATED  
WITH ANTICOAGULANTS

Author	Cases	Thrombo-Emboli	Autopsy	Mural Thrombi	Cardiac Rupture
Nichol	166	4	14	2	1
Peters et al	110	3	5	1	1
McCall	71	2	3	0	1
Parker-Barker	100	5	7	2	2
Fuller	34	2	0	?	?
Reich-Eisenmenger	24	1	0	?	?
Greisman-Marcus	75	3	1	0	0
Total*	580	20	30	5	5

\*Wright's 76 cases not included as he chose cases with T. E.

treated patients and those receiving anticoagulants, though statistically highly significant, does not reflect the true value of anticoagulant therapy as much as the reduction of thrombo-embolic lesions with subsequent morbidity.

It is now possible to confidently attend patients with acute myocardial infarction, secure in the knowledge that proper heparin-dicumarol therapy will greatly minimize one prime failure of the usual treatment i. e., the development of thrombo-embolic complications, the full import of which will especially impress cardiologists injured to the tragic development of a fresh myocardial infarction or cerebral, pulmonary, or peripheral thrombo-embolization, just when recovery from the primary insult seemed assured.

## LONG-TERM PROPHYLAXIS

As coronary thrombosis in dogs was shown by Solandt and Best<sup>18</sup> to be prevented by the use of heparin, it is conceivable that coronary thrombosis may be prevented in clinical practice by the continuous use of dicumarol.

The premonitory signs of an acute attack are often absent and when present are frequently misinterpreted except in retrospect, and as detection of the crucial point when anticoagulants are required as a preventive measure is often impossible, dicumarol must be used continuously after recovery from an acute attack if an attempt to forestall recurrent coronary thrombosis is to be undertaken.

After the first month of dicumarol therapy during the acute episode the time interval elapsing between prothrombin tests was extended to twice a week, and by the end of the second month was often extended to once a week. After six months in some patients the tests were made at ten day intervals rarely at fifteen day intervals in patients exceptionally well "stabilized." Occasionally unexplained variations occur in tolerance for dicumarol even after two or three years treatment, so it is *never* advisable to extend the testing interval beyond fifteen days. Only reasonably intelligent patients were selected and all were well instructed in the purpose of treatment with dicumarol and the risk if directions were not followed. Urinalysis was done once or twice a month to detect hematuria, and liver function studies were made approximately every six months in most cases.

A preliminary report<sup>19</sup> in 1946 described the first cases managed in this fashion. Foley and Wright<sup>20</sup> have lately reported success with similar long-term therapy. Thirty-four patients have followed the regime for three to twelve months and 20 patients from one year to five years (54 cases in all). Five patients discontinued therapy after three to twenty-three months. Nine patients died while under treatment. Autopsy was performed in 6 cases, revealing fresh coronary thrombosis or infarction in 2 cases and cerebral hemorrhage in 2 others. In 5 cases death was ascribed to either ventricular fibrillation, acute coronary insufficiency or congestive heart failure. No mural thrombi or other complicating thrombo-embolic manifestations were found.

Major hemorrhage developed in 10 cases. Patients taking dicumarol for months or years run more risk of hemorrhage than patients taking dicumarol a few weeks only, and 2 developed fatal hemorrhage. One patient died with cerebral hemorrhage which probably was not induced by dicumarol as the right lenticulostriate artery was ruptured, and it is unlikely that he would have survived the eight months he did after 3 attacks of myocardial infarction without dicumarol in view of his poor condition.

Another hypertensive patient with marked cerebral arteriosclerosis and congestive heart failure died in convulsions and coma after two months of dicumarol therapy and at autopsy petechial hemorrhages were found in the capsule and pons.

#### SUMMARY

The rationale and the results of anticoagulant therapy in acute myocardial infarction have been reviewed. Data on 656 "treated" cases reported to date, including 98 additional cases of the author, none of which were incorporated in the American Heart Association Committee Study are presented. The mortality rate was 13.1 per cent and exceedingly few thrombo-embolic complications were encountered. These data compared favorably with the American Heart Association Committee Study, but lack a definite control group, although analysis of 2,325 cases reported since 1940 not receiving anticoagulants revealed a mortality of 28.8 per cent.

Long-term dicumarol therapy in 54 cases of the author, treated from three to sixty-one months in order to prevent recurrent attacks of myocardial infarction, is reported briefly and although no control series existed the results encourage further trial of long-term prophylaxis.

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## VAGOTOMY IN THE TREATMENT OF PEPTIC ULCERATION

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AND

JOHN T. SANDERS, M. D.†

NEW ORLEANS

Vagus nerve resection for peptic ulcer has not gained professional enthusiasm in the city of New Orleans. This is reflected in the fact that just 4 such operations have been performed at Charity Hospital, 6 at Ochsner Clinic, 4 at Touro Infirmary, 13 at Baptist Hospital, 1 at Lakeshore, and none

at Hotel Dieu. Our own experience\* with the procedure is limited to 4 vagus nerve resections performed transthoracically and 2 performed subdiaphragmatically, without combination with any other operative procedure.

I would like to report our results along with those of others in the city, to compare them with the results published in the literature, and to discuss the controversial issue as to what place vagus nerve resection has in the surgical treatment of peptic ulcer.

Animal experimentation was begun nearly sixty years ago, and thirty-seven years have elapsed since Exner performed his bilateral vagotomies in man. It was soon learned that the incomplete operation accomplishes little, while the complete operation causes gastric hypomotility, a complete absence or a marked diminution in the free hydrochloric acid, and a great reduction in the amount of resting gastric secretion. Clinically, the operation usually produces a dramatic relief from ulcer pain, prompt healing of the ulcer, but undesirable side effects of disturbed motility in a significant percentage of cases.

### RESULTS

The results in our 6 cases were satisfactory. All were cases of duodenal ulcer with complications which indicated surgical intervention. The postoperative morbidity was low with the exception of 1 case of atelectasis which required bronchoscopic aspiration. In each case ulcer pain was relieved. X-rays taken postoperatively showed healing of the ulcer. The insulin tolerance test was negative in 5 cases and was equivocal in the sixth inasmuch as the hypoglycemia was not adequate. The postoperative acid levels varied from a complete absence of free hydrochloric acid to only a moderate hypoacidity. One patient threatened to have major symptoms of gastric retention which disappeared with an adjustment in diet. A second patient exhibited transient symptoms of esophageal spasm. Both of these patients were rather pleased that

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\*As members of the Sellers and Sanders Surgical Group.

their chronic constipation appeared to be abolished by the operative procedure, but there was no troublesome diarrhea in any case. The postoperative sequelae were so mild in comparison with the preoperative ulcer symptoms that every patient was quite satisfied. After an average follow-up period of approximately nine months, there has been no significant change except 1 patient who now, after fourteen months, has regained his gastric motility, and his formerly complete anacidity is now four clinical units, although he remains asymptomatic and these changes have occurred in spite of a negative insulin tolerance test. This is in keeping with the observation of Moore who found that a year after vagotomy, in some cases the stomach partly recovered its motility and acidity in the presence of repeatedly negative insulin tolerance tests, which led him to conclude that this represented autonomy of the stomach, and that the beneficial effects which still persisted did so because the cephalic phase of secretion was interrupted, and stress and nervousness could no longer be transmitted to the stomach.

Of the 4 Charity Hospital cases, 2 were unsatisfactory. One of these exhibited the highest degree of gastric stasis in the series, amounting to as much as 1500 cc. of fluid, and required the daily passage of a Levine tube for about nine months. This gastric stasis occurred in spite of a pyloroplasty performed concomitantly with the vagotomy because of a recognized pyloric obstruction. Of the 6 Ochsner Clinic cases, only 4 consisted of the nerve resection alone and, of these, Penick considers only 1 to be satisfactory after a year's observation. Mahorner has performed the majority of the vagotomies in New Orleans but he has used it, as has Crile at the Cleveland Clinic, as a procedure to complement gastric resection in many of his cases and considers his results satisfactory in nearly every patient. O'Neil's several vagotomies consisted of about an equal number of satisfactory and unsatisfactory results. However, the latter seemed to be mainly psychoneurotic symptoms when postoperative x-rays showed no

presence of an ulcer. In summary, from a study of the records and from personal communication with the surgeons who were acquainted with the majority of the cases performed in this city, there was not enough information to attempt an accurate statistical grading. However, it appears that less than 75 percent of the cases were completely satisfactory. There was no mortality for vagus resection alone, nor was there an instance of persisting ulcer or of recurrent ulceration in the patients whose records were available.

The results obtained by Dragstedt in several hundred cases are outstanding. The mortality rate was less than 1 per cent. There was prompt healing of the ulcer, relief of ulcer distress, and negative insulin tolerance tests in 90 per cent, while persisting or recurring ulceration occurred in slightly more than 3 per cent and these occurred in that group which he considered represented incomplete vagotomy because of the positive insulin tolerance test. Undesirable side effects he found to be only transient and easily controlled. Only 3 failures resulted in Bancroft's series of 34 vagotomies, but Gardner and Hart reported symptoms of gastric retention to be of major importance in over one-third of their cases, necessitating a secondary operation in 14.3 per cent of the total. From the Mayo Clinic, Walters reported troublesome motility effects occurring with equal frequency among the positive and negative insulin tolerance groups but, surprisingly enough, nearly all the cases of recurrent ulceration or persistence of ulcer occurred in the group with negative tests. In the Lahey Clinic series there were instances of recurrent ulcers and recurrent hemorrhages. Smithwick recently showed a rather surprising effect of sympathectomy upon gastric acidity in the presence of peptic ulcer. Hypertensive patients with coincidental peptic ulcers who underwent thoracolumbar sympathectomies did not show the anticipated rise in hydrochloric acid levels which were expected to follow from an unopposed vagal effect. On the contrary, they exhibited a diminished level of hydrochloric



response to test stimuli. Smithwick discovered the records of 3 such sympathectomized patients who subsequently were subjected to emergency gastrectomy for bleeding ulcer when only the gastric antrum was removed. These patients exhibited postoperatively an achlorhydria which Smithwick proposed as the physiological result of the removal of only the gastric antrum and sympathetic nerves with the vagus still intact.

#### EVALUATION OF VAGOTOMY

Efforts to determine the place of vagotomy have led to a reevaluation of the results obtained by other surgical procedures in the treatment of peptic ulcers. In an analysis of the elective surgical procedures performed for peptic ulcer in our own group, there are 17 subtotal gastric resections and 1 gastroenterostomy, and the latter operation was performed for symptoms of obstruction by a relatively inactive cicatrizing duodenal ulcer. In the gastric resections we had 1 death, a mortality rate of 6 per cent, which was the result of pulmonary embolism. One stomal ulcer occurred which necessitated a second operation. This resulted from an exclusion type of resection. We do not hesitate to exclude the ulcer when it is in such a position as to be unduly hazardous to remove, but, of course, the antral mucosa should be removed when any part of the pyloric margin of the stomach is permitted to remain. Wangensteen has reported a series of nearly 100 such operations without the occurrence of a stomal ulcer. Malfunctioning stomas were troublesome in 2 of our cases and there was a mild dumping syndrome in yet another. In all, the final end results were considered to be completely satisfactory in only 82 per cent of the total. These results are fairly similar to a much larger series reported by Gardner and Hart whose operative mortality was 8.9 per cent but when excluding the emergency operations for hemorrhage, the corrected mortality was 6.6 per cent. Five per cent had recurrent ulceration and 6 per cent had postgastrectomy syndromes consisting of fullness after meals, regurgitation of food, ner-

vousness, weakness, dizziness, and inability to regain strength or weight. Similar analyses were made by F. B. St. John showing 85 per cent satisfactory results.

In New Orleans, the mortality rates for gastric resection for peptic ulcer as furnished by the record librarians in the following institutions are: Ochsner Clinic, 4 per cent; Touro Infirmary, 11 per cent; Charity Hospital, 11 per cent; Baptist Hospital, 7.6 per cent. The lower mortality rate for the nerve resection is very appealing when contrasted with the higher mortality rates for resection even at the expense of motility disturbances in a minority of patients. The incidence of stomal ulcer following gastric resections is reported as 5 per cent from the Lahey Clinic and as the same figure from Duke University Hospital. In both institutions an antecolic, Hoffmeister technic was the procedure usually employed. The Ochsner Clinic has the enviable record of 119 gastric resections with no incidence of marginal ulcer. Ochsner contends that when an adequate subtotal resection is performed and that when a short-loop, posterior gastroenterostomy is employed that the decreased vulnerability of the jejunal mucosa causes minimal trouble with stomal ulcer. Nevertheless, when one compares the average incidence of recurring marginal ulceration following gastric resection with the persisting or recurring ulceration after vagotomy, the results seem fairly close. The distressing symptoms of the postgastrectomy syndrome are balanced against the undesirable side effects which follow the nerve operation which occur in about the same ratio. Thus from the nerve operation, the mortality rate is low, the relief of ulcer pain is dramatic, the incidence of recurrent ulceration is about the same as that following gastrectomy, but a big disadvantage is the high incidence of gastric retention which requires a secondary operation in a fair percentage of cases. Dragstedt contends that the prevention of overdistention of the stomach in the early postoperative period by use of Wangensteen suction reduced this undesirable side effect to a minimum.

Where, then, should vagotomy be placed in the treatment of peptic ulcer? It is rather generally accepted that it is the treatment of choice in marginal ulcer following gastric resection, and concurring in this opinion are Ochsner, Lahey, Walters, Hart, as well as the more ardent supporters of vagotomy. In the treatment of such cases, Priestly reported only 1 poor result in a series of 16 cases of marginal ulcer following resection and 21 cases of gastrojejunal ulcer after gastrojejunostomy. Walters considers that the resection of the stomach and not the nerve is the procedure of choice in all other situations. It is less generally accepted that the nerve operation alone is dangerous in the treatment of gastric ulcer because of the high incidence of malignancy in these ulcers, but Crile favors the nerve operation for those gastric ulcers which are so high in the stomach that their danger of malignancy is less than the added risk of mortality of near total gastric resection which would be required for their removal. Moore considers young and middle aged patients, with chronic ulcers which occur under stress and strain and are only transiently relieved by food and alkali, as the ideal subjects for vagus resection. Hart is of the opinion that there is such a high incidence of gastric retention following vagotomy alone that it should probably never be used without a concomitant gastroenterostomy, whereas Lahey is opposed to gastroenterostomy because of the possibility of gastrojejunal ulceration if the acidity and motility are restored with the passage of time. Dragstedt, on the other hand, states that no other surgical method has obtained such good results in the treatment of gastric and duodenal ulceration, with and without gastroenterostomy, and on his service gastric vagotomy has replaced all other types of surgery in severe and intractable peptic ulcers. In our own cases, we, as well as our patients, have been satisfied, and the vagus resection operation compares favorably with the gastric resection series; however, the number is too small to be statistically of much value. If time proves Moore's observations to be correct in that

the stomach becomes autonomous while still being relieved from cephalic influence, and if gastrojejunal ulceration does not take place with this return toward a normal physiology, then the operation should gain wider application. Until then we should not perform vagus resection promiscuously, nor should we consider that it alters the rigid indications for surgical intervention in the treatment of peptic ulcer.

#### CONCLUSIONS

1. The majority of the leading surgeons in New Orleans consider vagotomy to be a poor operation for peptic ulcer, except in gastrojejunal ulceration after adequate subtotal gastric resection, where vagotomy is rather generally accepted to be the operation of choice.

2. There is no truly ideal operation for peptic ulcer. After vagotomy there are a significant number of distressing hypomotility symptoms, recurrent or persistent ulceration, and diarrhea. After subtotal gastric resection there is a higher mortality rate, and approximately 10 per cent to 20 per cent with symptoms due to postgastrectomy syndrome, "dumping syndrome", inability to gain weight, or marginal ulceration.

3. In the group of vagotomy cases collected from various hospitals in New Orleans, less than 75 per cent were judged as satisfactory results. Our own vagotomy series, however, compared very favorably with the results of our larger series of gastric resections.

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## A GASTROENTEROLOGICAL EVALUATION OF VAGOTOMY IN THE TREATMENT OF ULCER\*

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NEW ORLEANS

This review is presented to evaluate a method of surgical treatment for peptic ulcer currently in vogue, which involves resection or extirpation of the vagus nerves by either thoracic or abdominal approach. Although firsthand knowledge of the results of this operation is extremely limited in this medical center, a summation of existing knowledge on vagotomy serves a useful purpose. We are enabled to re-evaluate a live gastroenterological subject—the optimal means of treating ulcer and of appreciating the physiology of the vagus nerve as related to this disease.

### ANATOMY

The vagi arise from the medulla and pursue the longest course of any of the cranial nerves down to the esophageal plexus. Below this, the right nerve forms a single cord which courses along the back of the esophagus through the diaphragm to be distributed to the posterior and inferior surfaces of the stomach. The left nerve continues to the anterosuperior surface of the stomach and terminates in the fundus and lesser curvature. These preganglionic, parasympathetic vagus fibers terminate in the plexus of Auerbach situated in the stomach's mus-

cular coat. Interest in surgical division of the vagi has led to further studies of the course of these nerves. Bradley *et al* dissected 100 esophagi. In 92, one of three situations existed; in 64 two trunks were formed between the hiatus and 6 cm. above the diaphragm as in the classical anatomic description; in 7, there was a large plexus which formed two trunks at the hiatus; and in 21, long trunks existed for a distance of 6 cm. above the diaphragm. In 8 or 10 per cent, there was no constant or uniform course, and multiple branches existed. Chamberlain and Winship dissected 50 esophagi and found in 12 cases, or 24 per cent, that there existed a complex arrangement with two or more nerve trunks representing each vagus nerve. Bradley and co-workers found 8 per cent of cases with many small branches.

### EFFECTS OF VAGOTOMY

A fairly good correlation exists between the results of operation in animal and man. McSwiney found that the stomach nerves affect either pure tonus change or affect the rhythmic movements of this organ. The totally denervated stomach may function adequately. The physiologic changes after vagotomy are many. The vagi relax the cardiac sphincter in advance of peristalsis and exert a tonic effect on posture of the stomach. When the nerves are cut, achalasia develops, the stomach loses tone and becomes more readily distended with air. In dogs the tonic type of hunger contraction is lost. The vagus is inhibitory for the pylorus. There is questionable small intestine action and no demonstrable effect on the colon. The secretory effect of vagotomy is to abolish the cephalic or psychic phase of gastric secretion. Moore *et al* find in man a decrease of stomach motility with reduced acid in the resting unstimulated stomach. There is no change in sensation and no change in sensory threshold to balloon distention of the esophagus, stomach, duodenum, jejunum, and ileum. Nausea, vomiting, and epigastric fullness may still be experienced. Motility changes below the pylorus are transient and inconstant. The insulin test is the most reliable stimulus to demonstrate physiologic effects of vagot-

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omy on the stomach. Griswold found that the average night secretion in twelve hours was 1300 cc. before, and 270 cc. after vagotomy. Andrus was able to study a patient with a gastrostomy opening. He found that anger and resentment produced a typical vascular response with marked reddening of the mucosa. After vagotomy painful emotion, strong enough to bring a flush to the face, no longer affected the gastric mucosa. A study of reported cases leads to the conclusion that complete vagotomy promptly relieves ulcer pain. The means by which this takes place is not too clear. This effect is not due to section of the few afferent sensory vagus fibers, since they mediate reflexes and are not able to transmit pain. Relief of ulcer pain is also not directly related to reduction of acidity which usually follows this operation, since in some cases, pain relief occurs without any lowering of acidity. Pain relief may be due to diminished or absent peristaltic activity. Grimson introduced free acid into human stomachs without producing pain.

A consideration and evaluation of the results of vagotomy in man must of necessity be a slow process. Observation over a ten to twenty year period will give an accurate appraisal of the duration of relief and the relapse rate. Results of animal experimentation are important and will tend to forecast the future of vagotomy. Ferguson performed vagotomy on 10 monkeys. Cardiospasm was found in all and gastric hypotonia with delay in the onward passage of solid food. The acid tide was not lowered in 6. Two showed mucosal erosions at postmortem examination. Several workers studied vagotomy in conjunction with the Mann-Williamson operation. Preliminary vagotomy did not protect against these ulcers. After vagotomy, rats on a stock diet died in ten days from blood impacted in the stomach. The animal becomes an invalid and dies unless managed very carefully. Shapiro and Berg did subtotal gastrectomy and vagotomy in dogs with only temporary reduction in gastric acidity. They concluded that the stomach has compensating mechanisms. Beazell and Ivy after vagot-

omy on rabbits found that on a rough diet 66 per cent develop ulcers. On a smoother diet the incidence was 15 per cent. He believed that these ulcers resulted from mechanical trauma associated with gastric stasis. Alvarez found that half the rabbits after this operation developed diarrhea.

#### INSULIN TEST

The insulin test has been devised to measure completeness of vagotomy. Hollander performs this test by giving a Sippy diet the day before the test. No food is given after 7 p. m. and no fluid after midnight. A Levin tube is passed and the patient instructed to expectorate all saliva. Fifteen units of regular insulin are given intravenously. Every fifteen minutes thereafter the stomach is completely aspirated and a record kept of the time, volume, gross presence of mucus and bile, and titration of acidity. Every thirty minutes a blood sugar is run. Aspirations are kept up for two hours. At the Mayo Clinic 0.3 unit of regular insulin is given intravenously for each kilo of body weight; a 70 kilo patient would thus be given 21 units. An insulin test is considered negative when, with a blood sugar below 40, and adequate secretory cells there is no increase in free gastric acid. Complete vagal interruption produces a negative test. A positive insulin test occurs when the response to this procedure is an appreciable rise in free acid. The hypoglycemia acts like a central nervous system stimulus, probably acting on medullary centers, causing secretory impulses to be transmitted by way of the vagus nerves to the gastric mucosa. A fall in blood sugar to 50 mg. is usually sufficient to cause a rise in gastric acid. Glucose, intravenously, atropine, or vagotomy counteract this effect. The gastric juice secreted under these circumstances has the characteristics of pure vagal juice, a very high acid titre, stronger pepsin content than after histamine, and a greater amount of visible mucus. All secretory glands of the stomach are activated by the insulin reaction and hypoglycemia.

The test has proved accurate in dogs in which three types of gastric pouches were studied: the Heidenhain with no vagal in-



terruption, Pavlov with a small percentage of vagal fibers intact, and the vagal with all the vagus fibers severed. The response to sham feeding and the insulin test were studied. Hollander concluded that the test is not quantitative and does not indicate the amount of uncut nerve tissue. A negative secretory test may be due to several factors: (1) complete vagal section; (2) inadequate hypoglycemia even in the presence of some intact vagal fibers; (3) temporary achlorhydria even to histamine; (4) intestinal regurgitation. He applied the test to 43 ulcer cases. All but one gave rise to increased acid secretion. Postoperatively the test was applied to 21 patients with 11, or 52 per cent, giving a negative test. Opinion is divided as to the usefulness of the insulin test in man. Will it determine the completeness of vagotomy, the prognosis after operation, and which cases are future candidates for vagotomy? Waltman Walters found that the reduction in gastric acid and motility bore no relationship to the insulin test. Recurrences for the most part occurred in the insulin negative cases. In 10 cases with suspected recurrence after vagotomy, only one had a positive test. Moore *et al* found that complete vagotomy abolished the acid response to insulin induced hypoglycemia in the early postoperative phase. Harkins and Hooker did the test on 17 patients postoperatively; of 3 cases reacting to the test, 2 were reoperated and ulcers were found.

#### CHOICE OF APPROACH

It has been realized for many years that complete transection of both nerves was necessary to bring about the effects of this operation. The situation has not changed since 1892 when Krehl stated that transthoracic vagotomy in animals produced so much gastric stasis that dogs could hardly be kept alive while those who cut all fibers below the diaphragm saw no change in their animals. The few fibers which were left must have taken over all the functions of the two big nerves.

Because of anatomic variations complete vagotomy will be difficult or impossible in from 8 to 24 per cent of cases by either ap-

proach. Weinstein, Colp, *et al* report a case autopsied after the surgeon believed a complete vagotomy had been performed and found that only 60 to 80 per cent of the fibers had been interrupted.

Transthoracic vagotomy has been entirely abandoned by Dragstedt, the surgeon who first gave renewed impetus to the study of effects of vagotomy. He concluded that chest pain postoperatively is annoying; that the transthoracic route does not permit abdominal exploration to confirm the diagnosis, and does not permit simultaneous abdominal operation. Grimson abandoned this procedure because 10 patients required drainage operations later. Because of anatomic variations Chamberlain and Winship question the practicability of the transabdominal approach. Colp and Klingenstein in the treatment of recurring gastrojejunal ulcers use the transthoracic approach.

The abdominal approach is more widely employed at the present time. It is best for the treatment of duodenal ulcer because other operations may be combined with it during laparotomy. It also becomes necessary when gastric ulcer requires opinion as to possible malignancy of the lesion.

#### CLINICAL RESULTS

Clinical results of vagotomy to date vary. Evaluation of vagotomy is difficult because there is no uniform selection of cases, because of the natural relapse rate of ulcer patients, and because of the different techniques of vagotomy performed. It is also difficult to evaluate vagotomy because it is so frequently combined with other satisfactory, accepted surgical methods of treating ulcer, such as gastroenterostomy and gastric resection.

Dragstedt reviewed the results of 450 patients operated upon by him. During the period between January 1943 to mid-1945, 80 patients had transthoracic vagotomy. This was abandoned because of residual chest pain and inability to explore and perform simultaneous abdominal operation. From 1945 to mid-1946 vagotomy and gastroenterostomy were performed on all duodenal ulcers. The results were good. Since

1946 he has decided on the basis of pyloric stenosis whether or not anastomosis was necessary. Vagotomy alone was done on 202 patients; 168 had vagotomy plus gastroenterostomy. There were 4 deaths. Three hundred and forty insulin tests showed complete vagus section. The ulcer recurred in 8. He states that he was able to control the side effects of the operation.

Certain unfavorable results are reported. Warren reports a patient who developed pain three weeks after vagotomy and was found to have retained 80 per cent of the barium meal. The stomach was resected and showed two gastric ulcers, one chronic and one acute. Grimson, Baylin, *et al* operated on 57 ulcers which were refractory. Secondary gastroenterostomy was necessary in 5 of the 41 patients originally treated by vagotomy alone. Eleven had persistent fullness after meals, 10 had foul eructations, 5 had lasting colicky pain, 1 had serious diarrhea, and 11 had continuous or periodic looseness of stools. Nine patients of 32 were completely satisfied with the operation. Later, reporting results in 104 patients in a 4 years, Grimson and Baylin concluded that vagotomy alone is not a satisfactory treatment for ulcer. One out of 4 cases required later gastroenterostomy. One out of 10 had ulcer pain, and in 1 out of 25 there was definite persistence or recurrence. Of this group only 23 of 49 patients were satisfied with the end results.

Moore first reported the results of the operation to be good in 87 per cent of his cases and poor in 5 patients, and 5 other patients had severe side effects. Later he stated that 11 per cent of the cases recurred. There were also postoperatively patients with minor symptoms, who showed x-ray evidence of ulcer. He is still following the cases very carefully. Walters in 1948 stated that we must allow five to ten years to elapse before finally judging results of this operation. He finds that with vagotomy plus gastroenterostomy the results are not much better than that of gastroenterostomy alone. In his experience 35 per cent of unsatisfactory results followed vagotomy alone. Aaron reported

2500 cases reviewed recently by the American Gastroenterologic Association with a mortality of 1.7 per cent. With vagotomy alone there was relief of pain in 85 to 90 per cent and recurrence of symptoms in 15 to 20 per cent. With resection plus vagotomy 84 per cent gave satisfactory results.

The question must be answered: How long do these effects persist after vagotomy? Grimson *et al* state that the effect on motility and on acidity persist up to four years. A few patients at two to four years had a negative insulin test change to a positive. Moore *et al*, however, found that one year after operation gastric motility in the resting state studied by kymograph returned to normal levels. Atony as seen by the fluoroscope was gone in three to nine months. Secretory changes, as tested by multiple quantitative overnight determinations of gastric contents, usually returned to normal in six to twelve months. The work of Vanzant in animals has never been disproved. Four of the 8 dogs previously vagotomized by Hartzell were studied two and a half years after operation. There was a return of normal acid values.

#### MEDICAL TREATMENT OR SURGERY

The great majority of ulcer cases respond to medical therapy. It behooves the gastroenterologist to study the cause of failure of the usual medical regime very carefully. I have treated apparently classical duodenal ulcer patients whose pain continued until food allergy was discovered and a milk free ulcer diet prescribed. Other patients frequently delude their medical advisers and continue smoking surreptitiously while on ulcer treatment. In other cases ulcer symptoms continue until psychogenic and psychosomatic factors are discovered and controlled. Patients must always receive adequate medical treatment before surgery is contemplated. The problem today is the comparatively small, difficult group of cases who seem to have an ulcer diathesis with marked hyperacidity, continuous interdigestive hypersecretion, and obvious autonomic and psychogenic imbalance. They do badly after the usual operations for ulcer. This is the group on which va-



gotomy should be tried. Until adequate time has passed and the results in the 11,000 vagotomies already performed are known, this operation had best be reserved for the treatment of the following special ulcer problems:

1. Gastric ulcer high up near the esophagus, unless malignant, because of the high mortality after resection.

2. Duodenal ulcer patients who need surgery because of pyloric obstruction in which vagotomy may be performed simultaneously.

3. In recurrent gastrojejunal ulcer in which vagotomy may prove to be the operation of choice.

4. In so-called ulcer diathesis when conventional methods of treatment have failed.

#### SUMMARY AND CONCLUSIONS

1. The duration of the beneficial physiological effects following vagotomy is not known at this time.

2. A final evaluation of vagotomy in the treatment of ulcer can be made only if this operation is performed alone.

3. Approximately 10 per cent of patients will have multiple divisions of the vagi above the diaphragm which make the operation of complete section difficult or impossible.

4. The operation has lowered night secretion, lowered gastric acidity, and relieved ulcer pain.

5. Stimulation of gastric acidity by insulin induced hypoglycemia offers a promising physiological tool.

6. The use of vagotomy should be limited at this time to selected cases.

7. The fate of the 11,000 patients already vagotomized should be carefully followed for ten to twenty years, to determine the final results of the operation.

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# THE PRESENT STATUS OF ANALGESIA AND ANESTHESIA IN OBSTETRICS\*

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NEW ORLEANS

The ideal agent to employ routinely in order to obtain analgesia and/or anesthesia in obstetrics has yet to be found. Principles suggested by Fluhman<sup>1</sup> in 1940 hold true today:

1. The ideal agent must alleviate suffering, not interfere with the progress of labor and be safe for the baby.

2. One must be familiar with the agent and know its contraindications.

3. One must know the dosage and optimum time for administration.

These principles may be applied to and utilized in the administration, as well as the critique, of old and new methods. Non-adherence accounts for the failures and pitfalls in the hands of the profession at large. Where one drug or combination of drugs is successful in one section of the country, the same drug may be discarded or rarely used in another section.

## HISTORICAL NOTES

In commemoration of the "Introduction of Anesthesia", Watson<sup>2</sup> relates how Sir Alexander Simpson, a British physician, used ether, for the first time in obstetrics, on January 19, 1847. The anesthetic was given to a patient whose labor was terminated by version extraction. On November 4, 1847 chloroform was first administered. Almost immediately, controversy was stirred up in this country. The arguments were based on "alleged indecencies committed by patients", plus the issue of whether or not it was right and proper to relieve a woman of the pains of labor by general anesthesia, "against nature".

The general use of anesthesia in obstetrics which soon spread through Scotland, France, England, Germany, and in a few months to America, was soon followed by an increase in maternal and infant mortality. In 1900 Murray of Edinburgh<sup>4</sup> found in his studies, that this increase in mortality was due chiefly to the *misuse* of anesthesia. Interference was limited prior to 1847 because it increased the "conscious suffering of the patient".

## ANALGESIC AND ANESTHETIC AGENTS

A brief review of some of the more prominent drugs employed during the past ten years will be discussed. In this manner we can evaluate from large patient series what the results depict.

- I. *Morphine Sulfate*: Probably used more than any other drug. It is fast acting, produces pain relief and unless given in very large doses, does not interfere with labor. Narcosis will be present to some degree in the infant if it is administered within three to four hours of delivery. Doses range from 1/6 to 1/4 grain.

- II. *Morphine-Scopolamine*: In 1902, Von Steinbuckel<sup>3</sup> used this combination to popularize what was to be known later as "Twilight Sleep". This form of analgesia enjoyed a long and violent popularity. Many babies were lost in deep narcosis. However, the principle of the combination is still used in some forms today, and is of great value if the dosage is intelligently and carefully administered. Morphine and scopolamine often relax a patient in long, tedious, exhaustive labors, only to have her awaken refreshed and capable of a happy termination. Narcosis and asphyxia may be more profound in the infant than when morphine is used alone. The time element must be closely guarded. Adair and Pearl<sup>4</sup> found by placing a rubber bag in uteri of multipara, five to seven days postpartum, and activating uterine contractions with ergonovine (.2 to .4 milligram doses) that morphine, gr. 1/4, or morphine, gr. 1/4, combined with atropine 1/150, produced no change in uterine tone. Morphine, gr. 1/4, combined with scopolamine, gr. 1/200,

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1/100 or 1/75, produced more relaxation between contractions.

III. *Heroin*: Lund and Harris<sup>5</sup> employed heroin in 454 patients and concluded that it was good analgesic drug. Heroin produces, in addition to relief from pain, euphoria and lack of depression. There was a 3 to 5 per cent increase in asphyxia neonatorum but less so than with morphine. Your essayist had an opportunity to use heroin in 1934 and is in complete agreement. It is regrettable that this opiate is unobtainable.

IV. *Demerol. Demerol - Scopolamine*: Alone or in combination, demerol has proved to be a good analgesic drug. Its combination with scopolamine produces deeper analgesia with amnesia.

Although it would appear that demerol is less toxic to the infant than morphine, one must not be lulled into a false sense of security. It is still an opiate in principle and capable of producing severe reaction in the baby. Irving<sup>6</sup> observed only two complications in 2446 patients. The popular administration begins with a dose of demerol, 100 milligrams, with scopolamine, gr. 1/150, when labor is well established, and cervical dilatation has begun. This may be given intravenously although its effect is very satisfactory intramuscularly. Schade<sup>7</sup> uses this method with terminal pudendal block. His results are excellent. Should additional analgesia be desired repeated doses of 100 milligrams or less may be administered, with or without scopolamine. If amnesia alone is desired, scopolamine alone may be repeated in 1/200 grain doses. The effect of demerol on the uterus is similar to that of morphine, allowing a patient to relax, and labor to progress to a normal termination. If terminal inhalation anesthesia is used, this combination is a desirable preanesthetic medication, requiring less gas, with easier induction and a dry bronchial tree.

V. *Dolophine*: A new drug proved disappointing in Lund's<sup>15</sup> study. Compound No. 10720 gave fair to good results in two-thirds of his series. No toxic reactions were observed.

VI. *Barbiturates*: Everyone is familiar with the barbiturates which are administered orally. Each of many varieties has enjoyed popularity. Although the absorption rate, grain dosage, and recovery rates vary somewhat, in reactions of the mother and baby, barbiturates have much in common. In small dosage mild hypnosis is achieved. To obtain amnesia, large doses are necessary and to obtain analgesia or anesthesia via the oral route, near lethal dosage must be employed. The critical dose as far as the baby is concerned is far less. Patient excitement may be troublesome. If given near the delivery hour hypnosis and asphyxia in the infant is usually assured. In combination with morphine or demerol-scopolamine analgesia very small doses of oral barbiturates are helpful in relaxation and alleviation of apprehension.

Irving<sup>6</sup> reported 14,676 patients in whom pentobarbital was administered. Respiratory accidents occurred 1.75 times more than when seconal or amytal was the agent. Pentobarbital in oral doses of 3 grains produces no change in uterine activity except to lengthen the interval of contractions. Barbiturates have some value if rest is desired in lengthy and slow-progressing labors.

VII. *Intravenous Analgesia: A. Sodium Pentothal*. Mazzola<sup>8</sup> (one of many investigators) utilized this agent in 300 deliveries. The dose averaged between 0.89 and 1.40 grams, intravenously. Delivery occurred in thirty-eight to seventy-one minutes. In cesarean section he warns that the baby should be delivered in five minutes after the injection. The safety factor is questioned.

This is a rapid acting, comparatively quickly detoxified drug. It bears all of the general objections to barbiturates. In cesarean section under local or spinal, this agent is ideal if used to relax the patient after the baby has been delivered.

B. *Eripal*—Similar in use to pentothal sodium.

C. *Vinbarbital Sodium (Delvinal)*. Kohl<sup>9</sup>, Lewis and Boddie<sup>10</sup> and Lewis<sup>11</sup> have used this type of analgesia in 3150 patients.

The average dose consisted of 9 grains orally, with scopolamine gr. 1/150 during labor. Scopolamine was repeated when necessary. For delivery, 8-20 grains were administered intravenously. Their operative rate was 53 to 57.5 per cent. It is interesting to note that 11.6 per cent to 18.9 per cent of the infants were asphyxiated to some degree. Postpartum, the mothers slept from one to eighteen hours, often alarming their families.

*D. Dial Urethane.* A dose of 4 cc. intravenously at 2 cms. dilatation was used by Van Del<sup>12</sup> in 2,000 deliveries. Morphine, grs. 1/8, was given one half hour later. The operative delivery rate was 25.4 per cent. There was no narcosis noted in the infant. This was probably due to the early administration of the drug.

*E. Paraldehyde*—This agent was given intravenously in 100 patients by Gardner and Sage<sup>14</sup>, in doses of 0.7 to 1 cc. of a 10 per cent solution per kilogram body weight. Doses averaged between 36 to 150 cc. Analgesia was of brief duration, arm pain, resulted in 44 per cent, cough in 2 per cent and hiccup in 6 per cent of the patients.

*VIII. Rectal Analgesia. A. Gwathmey*—This type of rectal analgesia enjoyed great popularity in some centers and is still used by a few. The original formula consisted of:

Quinine alkaloid .....	20 grains
Alcohol .....	45 mms.
Ether .....	2½ oz.
Olive Oil qs. ad.....	4 oz.

A specialized apparatus is available for introduction of the drug to simplify administration. Variations of the original formula consist of deleting the quinine and substituting mineral oil for olive oil. Many object to the unwieldy procedure. Ether can be detected on the mother's breath soon after the drug is given and almost universally on the baby's breath at delivery. In some mothers it has the undesirable effect of acting as an enema.

*B. Evipal* has been used rectally in 705 deliveries. (Anderson<sup>16</sup>). There was an operative incidence of 50 per cent. Five

per cent of patients were difficult to manage. The dose used was 1½ grams combined with scopolamine, grs. 1/150.

*C. Sigmodol*—A barbiturate designed for rectal instillation gained popularity in 1939. Schmidt<sup>17</sup> reported 500 cases of which 40 babies delayed crying and 15 were resuscitated. My associates used this type of anesthesia and analgesia for a few years and abandoned it entirely. The chief objections were unpredictable patient behavior and drowsy babies at birth.

*D. Paraldehyde*—In the hands of Colvin and Bartholomew<sup>18</sup> this type of agent has stood the test for a number of years. Skilled in its use, it meets their requirements. Six to 8 drams in 1.5 cc. benzyl alcohol are given rectally. In 500 deliveries there were 12 per cent sluggish babies.

*IX. Analgesic Drugs Combined with Stimulants: A. Caffeine with Pentobarbital* was given by Daro and Stern to 116 patients.<sup>19</sup> Pentobarbital, 7½ to 10 grains, was combined with caffeine in 5 grain doses up to an average of 12 grains. Narcosis in the infant was evident in 15 per cent of the infants, whereas 23 per cent were affected when caffeine was not employed.

*B. Nicotinamide* was used in 159 consecutive labors under barbiturate hyocine anesthesia and considerably fewer babies required resuscitation. (Perdue<sup>20</sup>)

*C. Scopolamine-Apomorphine* was given to 500 patients by Hershenson and Brubaker<sup>21</sup> following the initial dose of 3 grains of seconal. Scopolamine, gr. 1/100, apomorphine, gr. 1/100, was given initially, then 1/150 scopolamine and 1/50 of apomorphine was repeated at two hour intervals. Vomiting occurred in 24.5 per cent, excitement in 21 per cent and there was no appreciable increase in blood loss, and no demonstrable depression in either full term or premature babies even when given shortly before delivery.

Further investigation of the use of stimulant drugs may prove of great value if given to counteract an undesired effect of analgesia or an ill-timed dose.

*X. Inhalation Anesthesia: A. Ether*—



Low in cost, low in mortality, and its ease of administration, has won the general popularity for ether. Deep relaxation for certain operative procedures can be obtained with ether alone or in combination with the popular gases. Used alone the induction may be lengthy, and it is an upper respiratory irritant.

*B. Vinethene* may be used for procedures not to last over thirty minutes. (Hartman<sup>22</sup>). It has a very short induction stage. Large amounts of oxygen can be given in conjunction with it.

*C. Nitrous Oxide* popular for early analgesia is undesirable for long or deep anesthesia due to the low oxygen content for an effective mixture.

*D. Chloroform*—Portable and inexpensive, chloroform is used frequently in the home for terminal analgesia. Deep anesthesia is difficult to administer without danger and it is toxic to both liver and heart. Should not be used in toxemias.

*E. Ethylene*—More relaxation can be obtained than with nitrous oxide. The oxygen content is higher in anesthetic mixture, recovery is rapid, and if premedication has been given, ethylene is a satisfactory terminal anesthetic. For deep relaxation ether usually must be added.

*F. Cyclopropane* affords adequate anesthesia for all obstetrical procedures.<sup>23</sup> In 1392 patients, Karp and Richardson,<sup>24</sup> noted the following: The patient receives sufficient oxygen; there were no toxic effects on mother or infant. When atropine was given, laryngospasm rarely occurred and good color, free from anoxia, could be maintained. Irritation to the respiratory tract was minimal. This anesthetic, administered by one well trained, is of distinct value for deep and rapid relaxation.

**XI. Spinal Anesthesia (Saddle Block)**  
This anesthetic, given in a hypertonic solution of glucose, continues to gain popularity, and is one of the newest. Many thousand instances of its use have now been reported with more or less uniform results. Dieckman *et al*<sup>25</sup>, in a very carefully controlled series of 719 deliveries observed that "saddle block was a safe procedure in

trained hands and one of great value to parturient and fetus". Beck and Ball<sup>26</sup> here in New Orleans, analyzed 966 private cases and arrived at the same conclusion. In our series<sup>27</sup> and in subsequent experience this form of anesthetic has proved applicable in private practice to about 50 per cent of patients. Other drugs are given for early analgesia. Saddle block is used only for terminal analgesia and delivery (last one to three hours of labor). Operative termination is the rule and midforceps rotations are slightly more frequent. We have had no difficulty with the last and there has been no increase in fetal morbidity or mortality from these procedures. Postpartum bladder catheterizations, once, eight hours after delivery, is the rule, but no infections are noted. The most satisfying feature of this anesthetic is to have the baby cry immediately at birth, free from asphyxia.

This anesthetic should not be used alone in deliveries wherein version extraction or breech extraction is the method of termination, or wherein uterine relaxation is of great importance.

Anyone using spinal anesthesia for delivery must be certain of the administrator and the careful observation of his patient. He further must be adept in the use of forceps at the midplane.

**XII. Spinal Anesthesia in Cesarean Section:** Spinal anesthesia in cesarean section may be extremely dangerous if not thoroughly understood and administered by highly trained anesthetists. Since a higher level must be reached, the patient does not sit up as in saddle block, and there is an almost universal drop in blood pressure, early in the procedure. Intravenous fluids should begin as soon as the patient is in position for surgery. Blood pressure determinations should be taken constantly for the first ten minutes. Occasionally vasopressor drugs are necessary, but more commonly the hypotension disappears and the blood pressure level assumes its former peak. Our anesthetists who understand this mechanism have no hesitancy in employing spinal anesthesia. This form of anesthesia has no place in the small institution unless it is so

manned. Certainly the operator should never give his own spinal anesthetics for cesarean sections.

It remains an ideal anesthetic if well managed. From the patient's standpoint, there is less nausea and ileus. Recovery is rapid, blood loss measurably less and the operative field is quiet. In the interest of the fetus, the baby cries often as soon as its head is delivered from the abdominal incision. In private practice and on the Tulane Service at Charity Hospital this anesthesia has been the one of choice for the past three years. There have been no maternal or fetal deaths or near deaths attributable to the procedure. With proper precaution and administration, it is equal to, and combines all the beneficial effects of local infiltration which we have appreciated for years.

*XIII. Local Infiltration:* A. *In vaginal deliveries* local infiltration can be given either as a pudendal block or as a parasacral block. This form of anesthetic occasionally becomes useful when delivering a patient who presents contraindications for inhalation and spinal anesthesia. The technic is described in any standard text book. Some deaths have been reported from infection and ischiorectal abscesses. These were no doubt due to faulty technic.

B. *In cesarean section*, local infiltration is possible. It is tedious, time consuming and equal in effect to spinal anesthesia. Occasionally it is a necessary procedure where again the patient is no candidate for spinal or inhalation anesthesia. After the baby is born, either morphine and scopolamine may be used for sedation, or some form of intravenous anesthesia of short duration.

#### CONTRAINDICATIONS

Most of the lack of success as well as the serious complications resulting from the use of obstetrical analgesia and anesthesia is derived from injudicious choice or agent, or its abuse.

Greenhill<sup>23</sup> points out in his review: In 44,894 anesthetics given at Wisconsin General, by well trained anesthetists there were 47 deaths or 1 per 1000. In a series of

988,588 anesthetics using ethylene, nitrous oxide, local cyclopropane, ether, chloroform and spinal, the death rate varied from 0 per 100,000 (31,426, ethylene) to 42 per 100,000 (91,263, spinal). There were 11 per 100,000 (146,970, local). The average was 17 deaths per 100,000. In this he condemns spinal<sup>23</sup>. Certainly in as large a series as this, all types of surgery, on all types of risks were included. One can only criticize the choice of agent, if at all.

Generally speaking, in obstetrics at least, general or spinal anesthesia should be omitted in patients with coronary occlusion, angina pectoris, congestive heart failure, or syphilitic aortitis, for they carry a high mortality. Valvular heart disease, uncomplicated by myocardial involvement, offers little difficulty to any form of anesthetic<sup>3</sup>. In thyrotoxicosis an abundance of oxygen is desirable. In upper respiratory complications at delivery, spinal or local will give the best results. Severe pre-eclampsics or toxemias are usually best delivered over pudendal block. This is also true for patients delivered with acute poliomyelitis and active tuberculosis.

Where cesarean section is necessary and general and spinal anesthesia is contraindicated, local infiltration will suffice.

Short acting intravenous anesthesia agents may be of value in many of the mentioned conditions either alone or in conjunction with local blocks.

#### COMPLICATIONS IN THE MOTHER

Analgesic drugs will produce marked excitement in many patients if used in large doses. This is particularly true of scopolamine-barbiturate mixtures. The patient's response is unpredictable beforehand and she soon becomes a menace to herself as well as to the obstetrical ward. Constant nurse attendance is mandatory and often unavailable. Extreme excitement can often be relieved only by additional drugs which immediately increase the threat of narcosis in the baby a hundredfold.

Barbiturates lower the prothrombin level in the blood of both mother and baby<sup>28</sup>, even in small doses. This is an additional indication for the routine giving of vitamin K to newborns at delivery.



Edema of the uvula and glottis has been reported on 8 occasions since 1945, due to scopolamine<sup>29-30</sup>. Scarification relieved 6, and in 2 tracheotomy was performed to save the lives of those women. Positive skin tests were noted. This is a serious complication which should be remembered, recognized and treated promptly.

Aspiration of stomach contents occurs when inhalation anesthesia is given.<sup>31-32</sup> If solid food is aspirated, massive collapse or a lung abscess may develop. If liquid is aspirated, a pneumonitis will develop. Prior to aspiration, should deep analgesia have been employed, particularly barbiturates, the cough reflex is abolished further complicating the picture. Mendelson<sup>31</sup> reported 2 deaths on the delivery table from aspiration. I know of 1 death at Charity Hospital during the past year. This patient aspirated stomach contents and died before any corrective measures could be instituted.

The underlying cause is delayed gastric activity with prolonged gastric retention during labor. Patients in labor should be restricted to surgical liquids. They should be told beforehand not to eat solid food if labor is suspected. Should emergency surgery become necessary shortly after a full meal has been consumed, gastric lavage should be part of the preoperative preparation. Spinal or local anesthesia lessens the risk. At any cost, every delivery room should be equipped with adequate suction facilities, airways, laryngoscope, and emergency tracheotomy set. When these tragic emergencies arise, time may be the deciding factor between life and death.

#### COMPLICATIONS IN THE BABY

Every day more attention is drawn to the importance of preventing asphyxia neonatorum. A deeply narcotized baby is a poor exchange for relief of consciousness in its mother. Although there is no measured relationship between asphyxia neonatorum and the type of anesthesia used, prematurity, complications of pregnancy and labor, method of delivery and misuse of analgesic agents all play some part<sup>33</sup>. The longer the anesthetic, the more the baby will absorb. Deftness, dexterity, and knowledge

of an obstetric procedure play important roles.

Morphine depresses respiration in the baby and decreases the volume of breathing by lowering the responsiveness of the respiratory center to carbon dioxide produced in the tissue of the body.<sup>34</sup> But even so, carbon dioxide will stimulate the respiratory center.

Earbiturates on the other hand, produce deep narcosis and the governing of respiration by carbon dioxide is abolished. Air is inadequate to support life and excessive increase of carbon dioxide in the blood and lungs excludes oxygen. These babies must be saved only by heroic efforts using oxygen alone. If analgesia is used, the obstetrician must be versed in the use of, and have available, a tracheal catheter and oxygen.

One of the most vicious cycles in obstetrics is that situation wherein a patient in long tedious labor demands maximum sedation. Due to the length of labor she receives more than her share. The complicated labor is finally terminated by operative means and the infant receives both trauma from the sedation and anesthetic, as well as from the operative procedure. Many of these deeply asphyxiated, unfortunate children live subnormal lives.

Although no accurate gauge is available as to how much anoxia a given infant can tolerate, attention is directed repeatedly to the behavior pattern in later life of children so affected. Rosenfield and Bradley<sup>35</sup> studied 673 children between the ages of three and thirteen. (Only children of superior intelligence). A marked increase in abnormal behavior pattern was noted in children who had had difficult resuscitation in infancy or asphyxia illness due to pertussis. The following is impressive:

Behavior	Occurrence in Babies Asphyxiated at Birth	Occurrence in Control
a. Variability in mood	64.3%	40%
b. Hypermotility	85.7%	57%
c. Impulsiveness	75.0%	44%
d. Short Attention Span	89.3%	42%
e. Fluctuant Recall	78.6%	35%
f. Difficulty in Arithmetic	53.6%	22%

Any mother or her physician will find difficulty in rationalizing the justification for heavy sedation if the ultimate result will be a problem child.

#### A SIMPLE PLAN

A. A patient's behavior in labor begins with preparation during the prenatal period. Few prospective mothers will demand complete oblivion in labor if they know what to expect, if they know the dangers to the baby. They must be taught that the most important item in a pregnancy is a live, uninjured baby. Then they must be assured and reassured that you will present that baby with as little discomfort as is necessary. Assurance, particularly to the primipara is paramount.

B. When labor is established, the obstetrician, (not the nurse or interne), should be present to evaluate the picture and reassure the patient as to her progress. Most patients will complain little if they know what is going on and what to expect in the immediate future.

C. As soon as labor progresses and the tempo of contractions with pain is intensified (with knowledge of the fetal status), demerol, 100 milligrams, combined with scopolamine, grain 1/150, intramuscularly, will suffice to take the "sting" out of the contractions and produce mild amnesia. The patient should be told what to expect from the analgesia. Rarely is more than one repetition necessary. The majority of patients will need only the one dose. If repeated, demerol, 100 milligrams, is given and scopolamine added if amnesia is desired (1/200 gr.). Once in a while for early apprehensiveness, seconal, grains 1 1/2 to 3, may be given. Sedation is withheld or at least limited, if delivery is anticipated within three to four hours.

D. When the cervix becomes dilated to 8 cms. in a primipara or 5 to 6 cms. in a multipara, providing that the presenting part is at or below the level of the ischial spines, saddle block terminal anesthesia is employed. Pontocaine, 10 mg., is given if the duration of one to two hours is desired, and novocaine, 5 mg., if longer analgesia is

desired. The average patient coasts in comfort to the stage for delivery, and delivery without further anesthesia is the rule.

E. If, often in multipara, delivery is anticipated in the near future, extremely light ethylene-oxygen anesthesia is administered with contractions and deep induction is administered for delivery. Universally the obstetrician is rewarded with a vigorous, healthy, unharmed baby, who will cry spontaneously.

If complicated operative deliveries, breech extractions and the very occasional version extraction, no anesthesia is begun until the stage is set for delivery. Deep cyclopropane anesthesia will render the task less difficult.

Although one cannot fully subscribe to the psychological approach of Grantley Read<sup>36</sup>, there must exist a mode between this and the common practice of forced coma in labor. If one errs, a better result will be the rule if that error is on the conservative side.

To quote Watson<sup>2</sup> once more:

"No honest obstetrician can ever promise to any woman an absolutely painless labor. He can promise to make her labor as painless as possible consistent with safety to herself and to her child. He cannot beforehand accede to a request for some particular form of pain relief. He must reserve to himself the choice of which method he will use and what stage in labor he will use it, according to circumstances."

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#### DISCUSSION

W. D. Beacham, M. D. (New Orleans): In the erudite manner which characterizes him, Dr. Dyer has presented an excellent evaluation of the present status of obstetric analgesia and anesthesia. At the outset he very properly recited the fundamentals by which all of the methods must be judged. His review of some of the more promi-

nent drugs employed during the past decade is an example of fairness. Many of us here this afternoon are convinced that demerol is much less hazardous to the infant than is morphine. Some of us do not hesitate to give 50 or even 100 mgm. of demerol to a patient, depending upon her weight, thirty to sixty minutes prior to section under spinal analgesia, although we certainly would not give a similar patient a comparable dose of morphine. His word of caution is well taken, one must always consider the possibility of drug sensitivity and be prepared to counteract it.

Babies in utero, like grown persons, show marked variations in what they can tolerate. Some of them are easily narcotized and traumatized while others are able to withstand large doses of drugs and high degrees of trauma. Excepting those cases with known fetal or maternal complications, there is at present no reliable way of telling in advance just which babies in utero will show a satisfactory drug tolerance. That means that we must be prepared to come to the rescue of any baby that fails to breathe satisfactorily immediately after birth regardless of how little or how much sedation has been employed. All of us well know that it is very important to aspirate the nares, mouth, and oropharynx during the actual delivery. Furthermore, we must have a suitable tracheal catheter so as to aspirate mucus, amniotic fluid, etc., from the pharynx, and if indicated, the trachea, so that the baby will have an unobstructed tract for the passage of oxygen. A first class resuscitation machine is so constructed that it protects the baby from dangerous degrees of positive or negative pressure and is indeed often life saving.

In our practice, we clear the air passages and administer oxygen by the resuscitator or inhalator part of the machine depending upon the respiratory activity of the individual baby. We caution against the loss of valuable time before getting oxygen into the baby's lungs. Furthermore, we again repeat the fact that many babies have a low trauma threshold; consequently, too vigorous attempts at resuscitation by uncontrolled pressures may defeat the purpose for which they are employed.

Routinely we give the baby 5 mgm. of Vitamin K, intramuscularly, almost immediately after the umbilical cord is cut. Furthermore, each mother-to-be is given 10 mgm. of Vitamin K during labor. Other medications can be given to her as indicated for the benefit of the baby.

The essayist has done well to mention the very important group of babies born of patients having complicated labors terminated by operative procedures after much sedation, and I agree with his statement regarding the unfortunate situation of these individuals in later life.

I had hoped that this presentation would not include the word "simple". I wish to suggest that

it be changed to a "rational plan." In this connection may I deplore the fact that too many lay publications have ballyhooed *simple, safe, painless* childbirth methods as Dr. Dyer says, "There is really no such thing."

Each case must be individualized. There is no substitute for obstetrical judgment.

Saddle block for the delivery of premature infants is indeed fine. It permits the administration of oxygen to the baby by way of the mother as indicated. Likewise we advocate its judicious use in certain cases of fetal distress or in which the fetus is apt to become distressed. Its use for the last two or three hours of many labors is also found to be highly satisfactory; however, one must be mindful of the fact that some of the headaches following the saddle technic are difficult to control by the intravenous administration of 50 per cent dextrose, pressure to the abdomen, or even opiates. And furthermore, it must be expected that some of the patients will hold the opinion that their postpartum backache is due to the spinal puncture. There again one must individualize and rationalize.

Regarding spinal analgesia for cesareans, may I state that I have used such since my days as a resident at Charity Hospital. Obviously one must not allow the analgesic agent to ascend to a dangerous level. Ideally a well trained anesthetist performs the intrathecal injection. If it is necessary for the operator to administer the drug in a small hospital, he must carefully and repeatedly check the level of anesthesia, the blood pressure, the pulse rate, and see that the infusion is progressing properly. That means that he must wait until the analgesic agent is fixed and be sure that the patient is in good condition before making the skin incision. Certainly a competent anesthetist must be at the head of the table constantly to administer oxygen as necessary, and to observe the blood pressure readings, pulse and respiratory rates, and color of the patient. One should promptly clear the upper respiratory passages of babies delivered by spinal sections to prevent aspiration by them of amniotic fluid and, in some cases, blood, inasmuch as they usually take a breath as soon or shortly after the face is exposed. By prompt action one can eliminate the necessity for passing a catheter into the trachea. It is agreed that cyclopropane is a fine anesthetic agent when properly administered. Because of its great potency, it requires a skillful anesthetist well versed in its use.

I have very much enjoyed Dr. Dyer's paper and I repeat for emphasis his opening sentence. "The ideal agent to employ routinely in order to obtain analgesia and/or anesthesia in obstetrics has yet to be found."

Thomas B. Sellers, M. D. (New Orleans): I should like to endorse the comments which Dr. Beacham has just given to Dr. Dyer's paper.

First, I should like to ask of Dr. Dyer what treatment he administers for, or how does he control, post-saddleblock headaches?

I wish to mention and emphasize the subject of fluids, which Dr. Dyer most ably discussed. At times, it is very difficult to maintain fluid balance in cases of prolonged labor, especially if the patient does not have the services of a special nurse. I think it should be routine to administer intravenous glucose to patients in labor over twelve hours.

The patient should be told to eat and drink very little after she notices early labor pains. Though these nagging pains often last for hours and we find the patient dehydrated, still, if much food is consumed, we find it remains in the stomach, a hazard for the anesthetist. It was my misfortune to lose a patient from aspiration pneumonia. I also want to endorse the precautionary measures which Dr. Dyer mentioned concerning the anesthetist, but I should like to emphasize this point: The average anesthetic accident is rare enough so that it is very difficult to get cooperation in having an adequate stomach tube in the delivery room. In the hospital in which I work, the tube is often lost when needed.

I also want to emphasize and reiterate the use of oxygen during anesthesia, administering as high a concentration as possible before the baby arrives.

Dr. Isadore Dyer (In conclusion): I think if any one asks Dr. Adriani, who we think is the father of saddle block anesthesia in obstetrics, the treatment for post spinal headaches, he would reply that he had none. We may go for months without seeing any postdelivery headaches, then all of a sudden we may have two or three on the wards. At one time we thought that drug sensitivity played some part. I believe that one thing that will prevent postspinal headaches is not to ambulate your patient too soon. Usually if they stay prone without a pillow for twelve hours after delivery, and then are slowly introduced to ambulation, postdelivery headaches are averted. If they have the slightest headache we keep them down flat for a couple of more days. In any case I have seen few headaches persist for more than two to five days.

As for the remark about food, we are impressed with the fact that many multiparous women who progress rather rapidly, often eat before they realize they are in active labor. Should labor begin shortly after a full meal a serious complication might develop when inhalation anesthesia is employed. I think that you should caution your patients not to eat if they think they are in labor.

Fluids by mouth, as a rule, will be digested rather well and certainly fluids aspirated are less dangerous to the patient than solid food aspirated.

I agree with Dr. Sellers that you should watch dehydration during the warm months. Obstetric



procedures on an emergency basis should be preceded by gastric lavage if the patient has recently eaten.

I want to thank Dr. Beacham for his good remarks, and I shall change my wording from a "simple" plan to a "rational" plan.

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## THE MANAGEMENT OF ACNE IN GENERAL PRACTICE

HENRY W. JOLLY, JR., M. D.

AND

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BATON ROUGE

*Acne vulgaris* is a chronic inflammatory disease of the pilosebaceous system manifested as comedones, papules, pustules, cysts, and nodules. The comedone or blackhead is the primary lesion being derived from the fatty plug at the orifice of the sebaceous gland. The site of predilection is the face although the back, chest and arms are commonly involved. Seborrhea as a rule is found associated with acne.

*Acne vulgaris* is slightly more common in the male than in the female,<sup>1</sup> occurring most frequently during adolescence, appearing at a younger age in the female than in the male, with incidence of occurrence at its peak at 15 years. However, there is no age group exempt as acne is found from infancy to old age. We were unable to obtain any racial statistics; however it has been our observation that acne is comparatively uncommon in the Negro, and in the white race those with darker skin suffer less frequently than the blond type:

### TYPES

There are many different types of *acne vulgaris* clinically, the most common types being:

1. The *comedo* type, consisting chiefly of blackheads and an oily skin.

2. *Acne papulosa*, small papules associated with numerous large comedones that have become inflamed causing a diffuse redness of the involved skin.

3. *Acne pustulosa*, composed of small sup-

erficial pustules and few comedones.

4. *Acne indurata*, deep seated indurated lesions as the result of coccigenic infection of papules. These may be destructive causing marked scarring.

5. *Cystic acne*, subsequent to the inflammatory type of acne leaving an oily seborrhea and inspissated comedones and cyst. The contents of the cyst are usually a blood tinged gelatinous fluid.

6. *Acne conglobata*, uncommon type, in which the comedones, papules, and pustules are associated with large abscesses, cysts, and discharging sinuses, which heal slowly and leave pronounced scarring and often keloid formation.

7. *Acne keloid*. Lesions are located on the back of the neck caused by the presence of numerous large or multiple comedones burrowing under the skin and becoming infected, leading to pustules and residual keloid formation. This type is seen commonly in the male especially of the Negro race.

### ETIOLOGY

The etiology of *acne vulgaris* is unknown, but apparently several conditions must exist before the reaction in the pilosebaceous system manifests itself as one of the clinical types of acne.

Stokes and Sternberg<sup>2</sup> in reviewing 921 cases of acne from an etiological standpoint found several factors of importance:

1. The *familial factor*. They found that the probability of the appearance of acne in a patient was some 26 times greater if there had been previous cases in the family. This they felt was due to a greater susceptibility to pyogenic infection.

2. *Age, endocrine factor*. Consistently emphasized though it has been because of the association of acne with the puberal years, the endocrine factor in the causation of acne when brought down to present biochemical knowledge is disappointing. Considerable impetus was given to the study of endocrine balance in acne by Rosenthal and Kurzrok,<sup>3</sup> who found no gonadotropic substance in the urine of 34 young women with acne. The estrus-inducing hormone was normal in 6 cases, present in traces in 1

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case, and completely absent in 27 cases. The favorable therapeutic application of these findings as reported by Lawrence and Feigenbaum,<sup>4</sup> Rosenthal and Newstaedter,<sup>5</sup> and Lawrence<sup>6</sup> by prolonged series of injections of gonadotropic substances (antuitrin-S) was not confirmed by later reports of McCarthy and Hunter<sup>7</sup> and Williams and Nomland<sup>8</sup>, using the same method of treatment.

3. *Hyperactivity of the sebaceous glands.* The activity of the sebaceous glands as an underlying factor in the acne complex is illuminated by several considerations, including first the evidence for a thalamic center of fat secretion. Experimentally it has been shown in rabbits, in which a lesion of the midbrain has been produced, that excretion of fat by the skin increases as much as 200 per cent. This is confirmed to some extent clinically by the high grade seborrhea commonly found in young women during an emotional upset or a depressive state. The activity of the sebaceous glands is also dependent on the carbohydrate intake, increasing greatly when the diet is high in carbohydrates.

4. *The scalp tie-up.* It seems that in acne with seborrhea of the scalp that the scalp acts as a focus of infection and as a sensitizer for the face and back similar to that seen in seborrheic eczema.

5. *The allergic element.* The apparent specific allergic reactions with decided flare-up of the acne after ingestion of chocolate or milk or other specific foods, and quiescence when these foods are eliminated from the diet. The infection-allergy phase of the acne complex has been confirmed by the flare-up or relapse of the acne with intercurrent infections in other systems as in gastrointestinal upsets, and upper respiratory infections.

6. *Water balance factor.* There is considerable experimental and clinical evidence that hydration of tissue is a direct predisposing factor to infection particularly to pyogenic infections. The hydration of tissue may be unfavorably influenced by a high carbohydrate intake, and alkaline ash diet, and by the action of ovarian and testicular

hormones as observed clinically in association with the cycle of ovulation and menstruation in women.

7. *Contact inoculation factor.* Picking and squeezing of comedones and pustules with inoculation of adjacent normal sebaceous glands.

8. *The rosacea background.* The acne frequently observed in those individuals who blush from the slightest embarrassment, the lesions having a distribution confined to the flush areas of the face.

9. *Fatigue and exhaustion.* The frequent observation of the exacerbation of acne when the patient is under strain, as in college or high school students during examinations or periods of exhaustive social activity.

10. *Vitamin, anemia, and constipation.* The pustular secondary involvement of the follicular keratoderma observed in avitaminoses in man suggest the desirability of liberal doses of vitamin A in treatment of the acne patient. The work of MacKay and Clausen<sup>10</sup> seems to indicate a definite increase in the resistance of the skin of infants receiving adequate amounts of vitamin A.

The vitamin B complex contains a number of elements for the management of acne patients. Vitamin B<sub>1</sub> has a beneficial effect on the motility of the gastrointestinal tract and should be used alone or as the B complex for the management of constipation in acne patients. The B complex also contains an achlorhydria preventive fraction which helps the utilization of the hematinic agents, as hydrochloric acid is essential to the proper and full utilization of these agents.

11. *The psychoneurogenic factor.* May affect the acne patient by emotional effects on the thalamic centers controlling fat secretion; the ill effects of vasomotor instability particularly of the face and neck; the depressive effects of emotion on the secretion of hydrochloric acid, and the action of emotion on the endocrine balance.

12. *Industrial factor.* Workers in industries, where prolonged contact with greases, oils, tars, and similar hydrocarbons is nec-



essary, frequently develop acne or a pre-existing acne may be aggravated.

13. *Iodide and bromide factor.* The ingestion of these halogens apparently aggravates acne and may produce acniform eruptions.

#### PROGNOSIS AND SEQUELAE

The prognosis and sequelae of acne vulgaris depends on the type of acne, the cooperation received from the patient in treatment and the time that treatment is instituted. However, we feel that it is generally agreed that one may expect good results in approximately 65 per cent of the cases, an improvement in 20 per cent and about 15 per cent failures. The final results, in the most favorable response, will leave some superficial negligible scarring in the mild or moderate cases, to deep disfiguring scars and keloid formation in the more severe types of acne.

#### TREATMENT

In acne vulgaris, as in any other disease of really unknown or multifactored etiology, treatment cannot be classified as specific and nonspecific or supportive. Therefore, we shall not impose upon you "our" treatment and close the discussion of other therapeutic phases. Instead we shall discuss all suggested phases of therapy endeavoring to bring them up-to-date and help evaluate them in our opinion.

Therapeutic agents and classes may be grouped as follows:

##### *A. Psychological:*

It is quite satisfying to note the change in many persons' personalities paralleling the improvement of their acne. There arises also the psychosomatic question. Mitchell Heggs<sup>11</sup> states acne often produces an inferiority complex, later an anxiety state. Some writers state the reverse is true.

At any rate the patient should be treated from a psychological viewpoint. Untold psychic trauma has been dealt many patients by telling them not to worry, their skin will clear up with age. These patients should be reassured—to place their minds at rest should there be a psychic etiologic factor, and secondly, to assure their cooper-

ation for the long treatment period ahead.

##### *B. Constitutional:*

The general patient should of course receive attention, not just the presenting complaint. Rest, anemia, foci of infection, constipation, and intestinal parasites should be considered and investigated. Some authors stress some, minimize others. Osborne<sup>12</sup> minimizes the role of constipation, Miller<sup>13</sup> suggests control of this complaint by diet and exercise. Habits of traumatizing the face with the nails and fingers should be strongly discouraged. It is a fairly common observation to see the right side of the face markedly more severe than the left merely because most people being right handed, that side of the face is more "accessible."

##### *C. Local Therapy:*

1. *Topical:* This undoubtedly is the most frequently used and abused form of therapy. Strong or irritating preparations are neither necessary nor beneficial. Since the overwhelming majority of patients suffer from excess oiliness, a removal of these oils is indicated. Klauder<sup>13</sup> recommends soap, water and the alcohols. Swartz and Blank<sup>14</sup> report the use of a detergent composed of 25 per cent sulfated oil (emulsifying agent), 25 per cent mineral oil, and 50 per cent water, as a cleansing agent used in 400 patients with good clinical results. They recommend its use three times daily on an unmoistened skin and removal with warm water.

Soap and water seem adequate in most cases as a cleansing agent. However, it must be borne in mind that many skins are chapped from overdrying by soaps, in which case its use must be decreased or some milder soaps used. Strong or medicated soaps are not advisable.

Keratolytic ointments and sulfur ointments or their combinations are still in wide use and are often beneficial if judiciously used. New preparations combining these medicaments have appeared in wetting agents and cosmetic bases. It seems questionable how much the efficacy of these drugs has been increased thereby.

2. *Surgical:* Some surgical procedures be-

come indicated in almost all cases. We believe they should be minimized as much as possible. MacKee<sup>13</sup> recommends no surgical procedures, while Klauder, Michelson, Sutton and Wile<sup>13</sup> advise incision of pustules and extraction of comedones. Warren<sup>15</sup> has suggested aspiration of cysts and possibly replacing the contents with penicillin.

Incision of lesions with a cataract knife is adequate in most cases and minimizes trauma and scarring. Comedone extractors are likewise helpful.

#### *D. Physical Therapy:*

1. *X-ray*: We believe this to be the most efficient single agent in our hands today. Its use should be limited to one thoroughly familiar with it. X-ray therapy in full tolerance doses is not 100 per cent effectual and failures are not uncommon. We further advocate its use be withheld except in very severe cases until the age of 15 or 16 has been reached.

2. *Ultraviolet Light*: Unlike x-ray, this form of physical agent has no depressive effects upon overactive oil glands. Its effect is usually temporary and its uses seem to be (1) merely as another peeling agent and one can cause peeling with any speed desired by varying the dosage; and (2) bacteriocidal, thereby reducing the bacterial flora of the skin.

3. *Cryotherapy*: Is not widely used but mentioned for thoroughness. A slush is made of carbon dioxide snow, sulfur, and acetone, and applied with a tongue depressor. Marshall<sup>16</sup> advocates it in failures from other treatment, dry skins, and in indurated areas.

#### *E. Hormonal:*

Liver, thyroid, pituitary and ovarian substances have all been used with great variance of opinion. Nyvell<sup>17</sup> states they are the treatment of choice. MacKee believes they should be used only if indicated by symptoms other than acne, Sutton advocates thyroid in all cases and paratharome in extremely deep seated types. Wile uses them only for menstrual disorders while Michelson and Miller believe them to be of no value. Osborn<sup>12</sup> agrees in the routine use of

thyroid and sees no necessity for a routine basal metabolic rate.

An improvement of 82 per cent is reported with pregnant mares serum in a group of cases with menstrual disturbances by Birnburg and Rein.<sup>22</sup>

We believe the use of hormones should be restricted to an attempt to regulate menstruation or other glandular disturbances. The absence of such an indicator as the menses in the male leads to their more universal use in that sex.

#### *F. Diet and Vitamins:*

Dietary restrictions are fairly uniform and eliminate or restrict chocolate, iodized salt, fatty<sup>18, 19</sup> greasy, and highly seasoned, sweet, and sea foods.

Straumfjord,<sup>20</sup> stressing that acne is due to hyperkeratosis of the pilosebaceous follicle, reports 79 per cent of 100 patients free or nearly so on 100,000 units of vitamin A, daily, for six months or more.

Stokes and Sternberg<sup>2</sup> recommend a high vitamin therapy stressing vitamin A for follicular keratoderma and vitamin B, for constipation.

Pyridoxine has been advocated but any explanation of its role is at present speculative. Jolliffe<sup>21</sup> and his co-workers reported encouraging results using on an average of 25-50 mgm. daily initially, the dosage being decreased or increased as indicated clinically.

#### *C. Vaccines, Antibiotics, and Drugs:*

Staphylococcic vaccines, toxoids, mixed vaccines and autogenous vaccines have been used and various authors are not in agreement on their benefit. We believe them rational to build up a resistance to secondary invaders but of no value as a primary therapeutic agent.

The use of the various antibiotics and chemotherapeutic agents is attacking the problem from the same point of view as in the use of vaccine therapy only their effects are even more temporary and secondary than those of vaccine therapy.

#### *H. Cosmetics:*

The question of their use over a skin affected with acne always presents itself in



the handling of female patients. The use of the type of cosmetics that produce a cake-like mask and mechanical follicular plugging, even though temporary, seems contraindicated. Otherwise, cosmetics should be allowed provided there is no allergic element. Female patients are much more likely to cooperate if cosmetics are not ruled against.

### *I. Seborrhea:*

The treatment of this condition will not be dealt with here. However, because of its frequent occurrence in acne patients, its treatment should be incorporated with treatment of acne.

### CONCLUSION

It is not wise to form an ironclad "routine" of therapy but some nucleus of therapy should be arrived at by the clinician upon which to build the therapy. This nucleus of therapy will naturally depend (1) upon one's ideas of etiology, and (2) upon one's experiences with the various medications. The addition to or subtraction from this nucleus of therapy should depend upon the presenting clinical features.

Every case of acne cannot be treated with all suggested forms of therapy and the various clinical features of each case must determine which form or groups of forms of therapy will be followed.

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### DISCUSSION

Dr. M. T. Van Studdiford (New Orleans): It is a shame that two such excellent papers should have fallen upon the ears just of dermatologists and not upon the ears of general practitioners, surgeons, gynecologists, and obstetricians, all of whom treat acne.

I can add only praise to the gentlemen for their thorough work-up of their papers. Dr. Bradley\* very mildly claimed what results he got from para-aminobenzoic acid. He very graciously did not claim too much credit but left a loophole. He is perfectly justified. I saw Dr. Bradley's patient, and I will say para-aminobenzoic acid might be a drug for trial in cases of lupus erythematosus. From nearly a morbid state it brought his patient to a state of comparative wellbeing, and although not well, he was walking around in perfect comfort.

Acne is such a bugbear to dermatologists because of the superstitions of the public; the superstitions that x-ray makes scars, and that the doctors make the patient worse, are so instilled in the people that it really raises your blood pressure when you hear the weird expressions from patients, their friends, and some poorly informed of the profession.

People go to their doctor because they have acne, not because they want it produced. But they would like to have the public believe that the scars and pustules they have on their face were put on there by treatment, and their mothers would like to place the blame not on the changes of

\*Subacute disseminated lupus erythematosus by David F. Bradley, M. D., New Orleans M. & S. J. 102:83, (August) 1949.

adolescence, but on the dermatologist, or on the x-ray treatment that is subsequently taken.

I do not think sugar has any effect at all on acne, unless the person is a potential diabetic. So I get my blood pressure up when patients tell me they have to be dieted and they do not want to be x-rayed. If I feel that x-rays are justified, they are either treated by x-rays or by someone else. I don't believe you can take a superstition and work it into some good routine manner of treatment.

Now it is known that if a person squeezes blackheads or pustules without removing the plug, or without making an orifice to let the material be expelled, they are going to force the bacteria into the surrounding tissues and make it worse than if it were left alone. I believe in opening the pustules and expelling the caseous mass that must otherwise be absorbed, and when it is absorbed you have an erythema and the pathological stimulation makes the acne worse.

I think we should, as dermatologists, say that x-ray does not cause scars, and that the scars are the result of abscesses, and if the abscesses are not allowed to form they do not get as large a scar as if the abscesses are allowed to spread into all dimensions. We must impress upon people that they inherit the skin that covers them. It is not wished upon them by nature after they have been born, but it was wished upon them while they were in the womb, and they are going to carry that skin through life. If they have a chronic, 15 per cent failure type of acne, impress that on these people so that they will not blame the dermatologist, but blame their parents or forebears, whoever gave them their type of skin.

It is not a very easy thing to impress upon a person, but after a while they look at themselves in the mirror, and look at home to see whom they take after, and look at the scars on the old lady and on the grandmother, and begin to figure that the old lady and the grandmother were lying a little when they said they didn't do this or didn't do that.

Dr. J. K. Howles (New Orleans): A few points on acne still stare us in the face. The thing that puzzles me is why do we have more acne—and we definitely do; it is not imagination—in the younger generation than we had previously? I have thought of it from several angles. Certainly from the glandular standpoint, there should not be any difference from previously. I have considered the partially sedentary mode of existence; today people get in the automobile or bus, where formerly they walked. While they do have exercise in school, it is limited to gymnasium work which is a poor excuse for routine exercise, and they get that once a week. Another point is diet: I believe I agree with Van Studdiford that it is less important in the general run of acnes.

There is a group, in my opinion, that acts entirely differently from the general rule of acnes,

as the acne is prone to persist after passing the age of puberty into young adult life and even into late adult life. I have no solution to it. I think the sedentary mode of existence and the fact that we have more chocolate bars and sundaes—that's possible.

The only thing that impresses me is the fact that people come and tell you about x-ray scarring the face. I agree that you should educate people to the fact that it is the pathology of acne that accounts for the scarring and the lesions. Now, how x-ray can produce a pinpoint scar is beyond me. I have never had anyone explain how or why x-ray could produce a pinpoint scarring.

Another thing is having the x-ray treatments done at the local hospital instead of the private laboratory. I definitely object to using the hospital as your laboratory; I think the private clinician should have a chance at that before we support the institutions. The thing that amuses me (and I am sure you have all had the same experience) is that when we go to academy meetings, which to us is like going to Mecca, we have a symposium on acne, and someone has the job wished on him to present the subject. We have the symposium on acne and it usually boils down to the same remarks: X-ray is the best single treatment; opinion on diet varies with different people; the hormone factor, about the same as described by Dr. Jolly. X-ray is the best single treatment.

The one thing I want to add is concerning the misconceptions and erroneous idea that acne gets worse during pregnancy. In my opinion that is not so. Many cases clear up during pregnancy and when the menstrual cycle starts again, the acne is back again.

Dr. C. B. Erickson (Shreveport): I have no original views about acne. I am in accord with the views of the essayists and pretty much in accord with what the two previous discussors have said. I will say, however, that there isn't anything that I do and have done in thirty years practice of dermatology that has given me quite the satisfaction that treating acne has. Granting it is not perfect, but if you can help those cases of depression and inferiority complexes that these young folks have, and give them a little brighter outlook on life, you have really done something that is worthwhile.

I don't think that any dermatologist would question the fact, as stated, that X-ray is the best single remedy we have for acne. I want to make a little comment about what Dr. Van Studdiford brought out about scarring and blaming the treatment for it. When that situation prevails, it's somebody's fault that the idea has been allowed to get in the patient's and their families' mind that acne is what produces the scarring and not the X-ray. I don't have that trouble at all any more. It takes only a few minutes to explain and convince the patient and the patient's parents that



scarring is due to the disease and not the treatment.

I don't see eye to eye with everybody here about the question of diet. I'm rather inclined to think it plays a rather prominent part. Nor do I subscribe to the idea that constipation has nothing to do with it; I don't think you can get best results without proper elimination.

Thyroid when indicated is a wonderful help, but it should not be given routinely. The same is true for ovarian preparations; only when really necessary. There is no specific for acne but I think if one takes the trouble and time to combine what we know, we can do a good job in this disease.

Dr. J. D. Youman (Shreveport): I have nothing to add to what has been said. I would like to stress the removal of blackheads as Dr. Van Studiford already has. I think by carefully doing this, you can minimize the scarring, and progress is faster. Care must be taken not to bruise the lesion.

Vitamin A was mentioned. I have not had any luck with Vitamin A, using 100,000 to 150,000 units a day for three to six months. In the first place, you have to wait three to six months before you can tell whether the vitamin A is helping. During that time, it is hard to tell if it is the vitamin A or the other things that you have done which have caused improvement.

Recently, at a meeting in Chicago, Dr. Stoesser was talking about infantile eczema. He said he was getting results with a new synthetic vitamin A preparation. It is not yet on the market.

## A CASE OF BILATERAL SPONTANEOUS PNEUMOTHORAX\*

JACOB FAUST, M. D.†

BATON ROUGE

Spontaneous pneumothorax in the apparently healthy has been a well recognized disease entity at least since Kjaergaard's monograph<sup>5</sup> in 1932. It is not an unusual disease. There were 873 cases in the U. S. Army in 1943.<sup>13</sup> Schneider and Reissman<sup>11</sup> estimated that about 1 in 500 of the inductees in New York gave a past history of this condition. Perry<sup>9</sup> was able to collect 67 cases from the London Hospital in fourteen years, from an annual admission of about 10,000. At Charity Hospital, in the past

five years, from an annual admission of about 50,000, there have been 12 cases.

Spontaneous pneumothorax is a disease of sudden onset, most common in young males, not necessarily associated with severe muscular activity. It is usually initiated by a dull pain in the chest which increases and becomes stabbing in character. It is relieved somewhat by leaning forward, and is associated with tachycardia and usually some degree of dyspnea. In rare instances it is associated with no symptoms whatsoever, being picked up on a routine chest plate. The usual physical and x-ray signs of pneumothorax are present and there are generally none of the changes in the white count, sedimentation rate, and temperature, usually associated with infection. There may be a little fluid in the costophrenic angle. The condition is benign, the lung tending to re-expand spontaneously within a few weeks in the majority of cases, though there are some on record in which a bronchopleural fistula and pulmonary collapse have persisted after twenty years. However, there is a tendency to recurrence, about 20 per cent of the patients having two or more attacks, usually on the same but often on opposite sides. Tuberculosis is no more common in these patients than in the general population.

The majority of these cases have been demonstrated to be due to one way valve vesicles, a portion of the lung being progressively distended by intake without egress of air until the limit of elasticity of the tissue is exceeded and rupture results. Among the causes of these vesicles may be mentioned scar tissue, localized emphysema, partial bronchial obliteration and congenital blebs of the pleura. These latter can often be demonstrated the fluoroscopy or at operation. The term spontaneous pneumothorax has over a period of time come to be applied largely to those cases who show no historical or x-ray evidence of associated disease, and should be differentiated from a much larger group with spontaneous collapse due to tuberculosis, asthma and emphysema, cystic disease of the lung, empyema, pneumokoniosis, postoperative dissec-

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tion of air through fascial planes, and the fairly common pneumothoraces in newborns which are probably related to over inflation of portions of the expanding lung. The patients, except for their tendency toward repeated collapse, are usually healthy, and death, when it occurs, is due to one of three rare complications: hemopneumothorax, tension pneumothorax, and simultaneous, bilateral collapse. This latter complication is the subject of this paper.

#### CASE HISTORY

The patient a healthy, hypersthenic, 23 year old, white male, a semiprofessional trombone player, was first seen on December 19, 1948. He stated that he had been playing touch football and had run out to catch a pass. On returning to the line of scrimmage, he first noted a dull pain in the right upper chest. There was no particular dyspnea, but he sat on the ground, expecting the pain to pass. Instead, it became progressively more severe and stabbing in character. It finally became so severe that an ambulance was called and he was brought to the hospital. There increased resonance over the right lung field was noted and absent breath sounds. An x-ray showed approximately 60 per cent collapse of the right lung (Fig. 1).

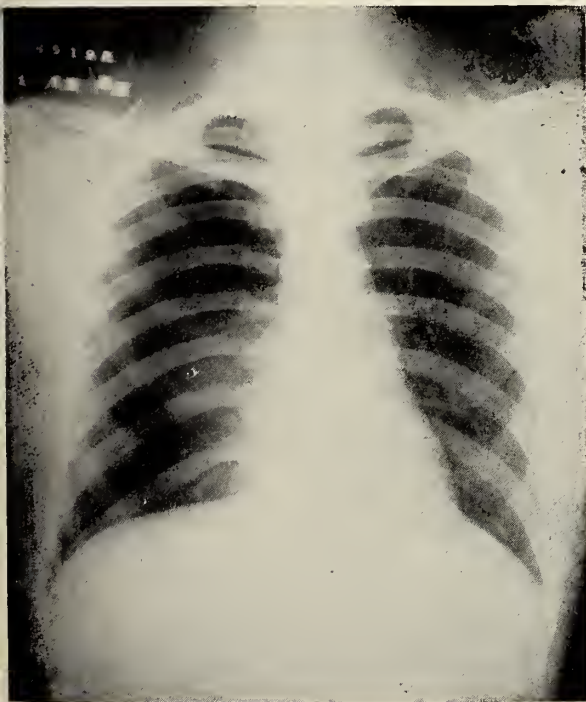


Figure 1—Right pneumothorax on admission.

(This x-ray is misdated and should be December 19, rather than January 19.) He was admitted to the ward where his temperature was normal; pulse rate 100; white count 15,000 with 76 per cent

polys, and sedimentation rate 9. He was placed on bed rest, codeine for the control of cough, and assured that this was a benign condition from which he could be expected to recover quickly. About 4:30, on the morning of December 22, he began complaining of severe pain in the left chest, and fairly marked dyspnea was noted. His respirations increased to 40 per minute. He sat up in bed, gasping for breath, and a slight amount of cyanosis was noted. A water trap was set up on the left side with some relief. However, during the later course of the morning, his dyspnea continued to increase, he became much more apprehensive, and x-ray taken at this time showed approximately 70 per cent collapse on the right and 50 per cent collapse on the left (Fig. 2). Ap-

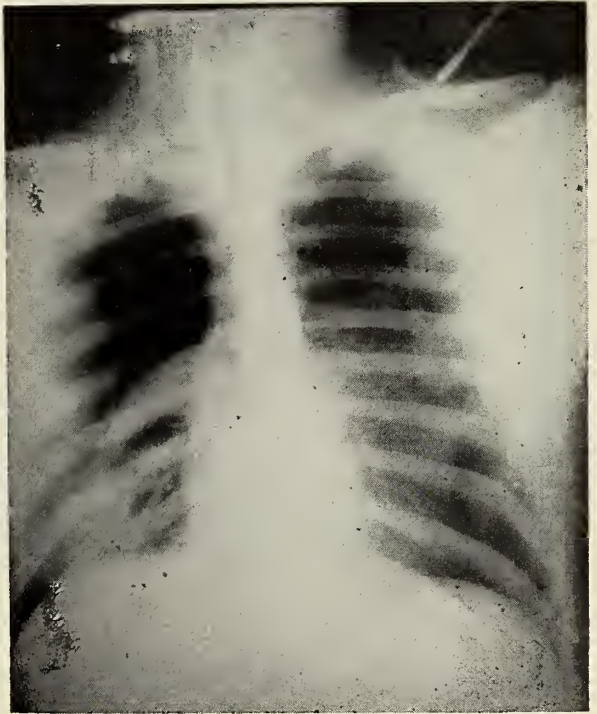


Figure 2—Bilateral pneumothorax approximately 8 hours after onset.

proximately 2,000 cc. of air were removed from the right pleural cavity and a water trap placed on this side as well. Marked dyspnea continued throughout the day in spite of oxygen and the use of the water traps. Toward evening the patient was febrile, with a temperature of 101° F., and drainage of a purulent fluid from the left pleural cavity. Patient had been started prophylactically on penicillin at the time of placing the second water trap, however, and cultures of the purulent fluid at this time and subsequently failed to demonstrate any organisms. The needles tended to become blocked by the exudate, and, in view of the continuing dyspnea, the Surgery Department was consulted. Soft rubber catheters were placed in both pleural cavities through trocar wounds; these



were connected to water traps and the result was a rather considerable improvement in the degree of dyspnea. Patient's course from then on was essentially uneventful. He continued spiked temperature between 101 and 102° F. until approximately December 29, and then over the next week it gradually declined to normal. By December 29, dyspnea had improved sufficiently so that it was possible to remove both catheters. X-ray at this time showed almost complete re-expansion of the right lung and expansion to about the level of the clavicle on the left (Fig. 3). There was a persist-

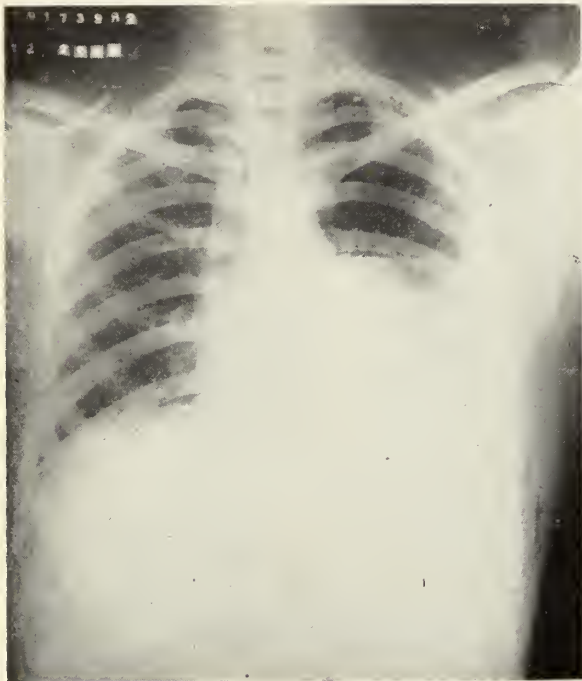


Figure 3—Almost complete re-expansion bilaterally shortly before discharge December 29, 1948. Some haziness at the left base, probably due to pleurisy. Penicillin was discontinued on January 7, and the patient discharged on January 13, comfortable. A subsequent x-ray on February 4, 1949, showed complete re-expansion of both lungs (Fig. 4).

Various causes have been suggested for these bilateral collapses. Dissection of air through the mediastinum or abnormal mediastinal passages have not been demonstrated in the autopsy cases; nor have any of the authors commented on crunching respiratory sounds in the sternal area. The best explanation seems to be that the same pathology exists in both lungs and that the hypernea, overdistention, and mediastinal shift induced by the first collapse helped bring on the opposite one. Oechsli and Miles<sup>8</sup> reviewed the literature in 1934, and



Figure 4—Apparently normal x-ray February 4, 1949.

found 17 cases of this type, of which 4 were fatal. They apparently missed the case of Markson and Johnson,<sup>7</sup> as it does not appear in their index. Hasney and Baum<sup>3</sup> found 2 cases of Rossel, with 1 death, and added 1 of their own. Since then there have been case reports by Priest<sup>10</sup> with death and a normal autopsy, Werner and Thearle,<sup>13</sup> with death and emphysema which was not apparent on x-ray at post-mortem, Baum,<sup>1</sup> Castex and Mazzei,<sup>2</sup> King and Benson,<sup>4</sup> with death, and Komrower.<sup>6</sup> These, with the present case bring the total in the literature to at least 28 with 8 deaths, a mortality of 28 per cent. The supplemental index lists 6 cases in the foreign literature which was unavailable to me, so that I am unable to decide if they meet the criteria heretofore laid down.

Various methods of treatment have been used—needles with water traps, one way rubber valves, repeated aspiration, and catheters with varying types of suction. No one individual has sufficient experience to evaluate various modes of therapy, but it would seem necessary to re-expand as rapidly as possible at least one of

the lungs, preferably the one first collapsed as its rupture is more likely to have sealed off. This may at times, with a large fistula, require the removal of considerable quantities of air, and machine suction through a large catheter may be necessary.

## SUMMARY

1. A case of bilateral spontaneous idiopathic pneumothorax in a healthy young male is presented with recovery following water trap suction through rubber catheters in both pleural spaces.

2. This is the twenty-eighth such case reported in the literature.

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## CEREBRAL PALSY TODAY\*

LYON K. LOOMIS, M. D.

NEW ORLEANS

To realize where we are, it is sometimes interesting for us to see where we have been. In 1862, Dr. William John Little first described the spastic as the child with scissors gait who drooled and grimaced and was believed to be feeble-minded. Because feeble-mindedness was made a part of the description, the child was usually considered untreatable and placed in an institution to be forgotten. This attitude would probably still prevail if it were not for the untiring efforts of a few individuals who have greatly broadened our knowledge about cerebral palsy, among whom must certainly be mentioned Dr. Winthrop Phelps. We now realize that the spastic described by Little is only one of five types of cerebral palsy and we also know that feeble-mindedness is often not present even in this type.

The present day interest in cerebral palsy is evident when reviewing the literature on the subject. During 1949, the number of articles in American medical literature approximately doubled the number in 1948. It has been said that cerebral palsy is rapidly becoming the tail that wags the dog in the broad field of work with crippled children.

## TYPES OF CEREBRAL PALSY

The *spastic* type results from damage to the brain directly behind the frontal (thinking) area. Therefore, mental impairment is more common in this type than in any other type of cerebral palsy. When movements are attempted, the spastic muscle in opposition to the muscle being contracted, contracts itself instead of relaxing as it should. This is noted by the examiner as a stretch reflex and is characteristic of the true spastic.

The *athetoid* type is due to damage to the basal ganglia area of the brain, which is the filtering or sorting out area for voluntary motions. Thus, undesirable impulses

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are allowed to pass to the muscles controlling joints, bringing about involuntary motions. Mental impairment in this type of cerebral palsy is rare because the area of the brain affected is relatively more distant from the frontal area. Clinically athetosis is characterized by involuntary joint motions, and increase in nervous tension may exaggerate these movements.

*Tremor* is another type of cerebral palsy due to damage to the basal ganglia causing involuntary motions of reciprocal action with regular rhythm. Two types of tremor are noted clinically: (1) intention tremor in which the contractions occur only on attempted motion; and (2) nonintention tremor in which the contractions are present all of the time.

The *rigidity* type of cerebral palsy is caused by a diffuse brain lesion such as multiple petechial hemorrhages or encephalitis. Clinically these cases have stiffness in the extremities without involuntary motions or stretch reflexes. The affected muscles lack elasticity and a lead-pipe sensation is observed by the examiner when stretching is attempted by moving the joint.

The *ataxic* type of cerebral palsy is due to damage to the cerebellum which is the center of balance control. Mental impairment is rare in this type. Clinically, there is frequently a staggering sort of gait, the patient walking and standing with feet apart in order to provide a wider base of support. The affected muscles are hypotonic and reflexes may be diminished. Because the voluntary cerebral motor centers are able to take over the function of the damaged cerebellum, ataxics are very amenable to training.

#### OBJECTS OF TREATMENT

(1) *To make the individual useful to society.* (2) *To enable the individual to help himself.* (3) *To make the individual happier.* If these objects are always kept in mind, it will readily be seen that most cases of cerebral palsy require treatment. Even if the case is extremely severe and homebound so that we know it is impossible for him to be educated to hold a job, we are

still obligated to train the patient to do little things for himself, which will make it easier for those who must care for him constantly. Even if these cannot be taught, we are still obligated to educate the patient in order to make him a happier individual providing he is educable.

#### SPEECH THERAPY

In treating the case, it must be remembered that the individual with cerebral palsy has five extremities: *one speech, two arms and two legs.*<sup>3</sup> The most important extremity is speech. Speech defects are frequently made the object of ridicule, although a crippling defect in the arm and leg is seldom held ridiculous. Since speech defects occur in 60 to 80 per cent of cases of cerebral palsy, we can readily see the need for proper emphasis upon speech therapy. We now know that speech defects are often brought about by incomplete shift of handedness. A moderate or mild degree of spasticity which can easily be overlooked or underestimated may exist in the dominant hand and if the child is made to use this hand with the thought that use will increase function, a severe frustration may be set up resulting in disturbed personality, speech, and learning. Dominance must be shifted completely to the good hand before rehabilitation is attempted.<sup>5</sup>

Good speech and use of the arms are certainly more important than spending all efforts to get the child to walk, yet how often we see the parent with the opposite viewpoint. It must always be remembered that many important positions can be held by persons with good speech and good arm function. Few positions can be held merely by the ability to walk.

#### PHYSIOTHERAPY AND OCCUPATIONAL THERAPY

The groundwork for rehabilitation of arms and legs is still occupational therapy and physical therapy, the former being most important for the arms and the latter most important for the legs. Various specific phases of these treatments have been called modalities by Phelps. There are fifteen different modalities for the five types of cerebral palsy:<sup>3</sup> massage, passive motion,

active assisted motion, active motion, resisted motion, conditioned motion, automatic or confused motion, combined motion, rest, relaxation, motion from the relaxed position, balance, reciprocation, reach and grasp, and skills. Some of these modalities are more important in one type of cerebral palsy than in another. For example, passive motion is more important in spastics, rigidities, and ataxics, but to less extent in athetoids and tremors. Relaxation is the basis of treatment in the athetoid but of no use in the ataxic. Motion from relaxed position is progression for the athetoid after he has mastered relaxation.

Some modalities are useful in all types of cerebral palsy among which may be listed the following: conditioned motion, combined motion, active motion, rest including supporting chairs, tables and braces, balance, reciprocation, reach and grasp, and skills.

#### SURGERY

Along with increased knowledge in the treatment of cerebral palsy by conservative methods has come greater caution in the use of surgery. Certain cases of the spastic type of cerebral palsy will need surgery after conservative treatment has failed. For example, a selective popliteal neurectomy is indicated on a patient of good mentality who is able to stand on the toes and has gastrocnemius and soleus spasticity resulting in knee flexion and equinus which cannot be corrected by physical therapy, night splints, or braces. Before doing this destructive operation, which will weaken chiefly the power to plantar flex, one must be certain that sufficient antagonist muscle power exists; otherwise, a flail foot will result and the patient may be worse off than before operation. The proper facilities for postoperative rehabilitation are imperative because proper splinting, bracing, and physical therapy after operation are often more important than the operation itself. Surgery is rarely necessary in athetosis and rigidities except to correct contractures. Surgery is practically never indicated in tremors and ataxias.

#### DRUGS

The efficacy of various drugs in the treatment of cerebral palsy is still a subject of much debate. At the present time it can definitely be said that for the most part drugs are only an adjunct to the more important methods of treatment. Prostigmine is still thought to have beneficial effect in the spastics and rigidities chiefly by aiding the finer motions such as speech and finger motions.<sup>8</sup> Dilantin appears to be helpful in athetosis and has advantage over barbiturates by relaxing without producing drowsiness. Myanesin (trade names sinan, oranixon and tolserol) has been reported helpful chiefly in athetoids,<sup>1</sup> but its efficacy has not been conclusively proved. In a recent report upon d-tubocurarine chloride (curare) in which 35 cases were treated, the authors felt that too much cannot be expected of the drug in the treatment of cerebral palsy.<sup>4</sup> The use of moccasin venom solution in a series of 100 cases was reported by Wheeldon who showed that there was subjective improvement in 50 per cent of the cases and objective improvement in 75 per cent<sup>9</sup> in athetosis, synkinesia and ataxia. Spasticity was not benefitted. Favorable results to date in the treatment of Parkinsonism with tri-hexyphenadil (artane) have been reported by Dow and Rosenbaum<sup>2</sup> in 8 out of 10 cases and it is their opinion that artane should be given a trial in every case of Parkinsonism. Schwab<sup>6</sup> and Tillman also report that artane alone and in combination with other drugs brought about alleviation of symptoms in 44 cases of Parkinson's disease. It is possible that artane will supplant the use of the hyoscyamine group which has been used considerably in the tremors. The ataxias should be given an abundance of B<sub>6</sub> and vitamin E which is probably an adjunct to improving muscle tone along with physical therapy.<sup>7</sup> Since children with cerebral palsy are frequently more nervous than normal, small doses of sedatives such as phenobarbital will frequently bring about slight general improvement as might be observed in any nervous patient. Improvement in general health by proper nutrition including vita-



mins must not be forgotten in the cerebral palsied as in the normal.

Slight improvement with the use of any new drug can frequently be expected from the psychological effect of trying something new. Remember that parents, patient and doctor are awaiting the miracle drug which will be the easy cure-all for cerebral palsy victims. To guard against overoptimism and the letdown which invariably follows when the new drug does not work the miracle, the doctor would do well to maintain a healthy skepticism toward all new drugs. This of course is difficult when laymen read of miracle cures in everyday print.

#### PSYCHOTHERAPY

The cerebral palsy patient is many times handicapped by his own personality, and if so, this must be influenced through training. Every cerebral palsy case is different from a psychological point of view and this must ever be kept in mind in treating the case by various methods. In general, the personalities of the five major types of cerebral palsy differ considerably. The spastic is usually an introvert whose life is dominated by fear, such as fear of loud noises, falling, and new surroundings. The athetoid on the other hand is usually an extrovert, has few fears, is quick to make friends and is aggressive. The ataxic resembles the athetoid in that fear is not highly developed and affection is highly developed. The intention tremor has a personality similar to the spastic and the non-intention tremor is more similar to the athetoid. Great consideration must be given to these various elements, especially fear, in the handling of the spastic case.

Occasionally consultation with the psychiatrist will be of great help in developing confidence to do certain things that seem almost unsurmountable. This may be true when the child is nearly able to stand by

himself; proper psychotherapy may be of much aid in helping him pass the hurdle.

There is probably no other disease in which the proper relationship between parent and child is more important than in cerebral palsy. There can be no doubt but that the parents of the child with cerebral palsy should routinely take an intensive course to better understand their child and his mental and emotional makeup before attempting to embark upon the long voyage of living with him. If the wrong relationship is started early in life, the child may easily be spoiled from too much pity rather than neglected from too little love.

Recreation and hobbies are important. Summer camps are now being held in many parts of the country, which are geared to the life of the child with cerebral palsy. It gives the child something to look forward to and plan for as it does the normal child.

Photography can be as good a hobby for the cerebral palsied as it is for the normal for it gives opportunity for originality and expression. Of course, it may be necessary to improvise some special apparatus to hold the camera securely in position. Let us try to see that these children lead as well rounded and balanced a life as is possible.

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## NEW ORLEANS

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## ORGANIZED MEDICINE AND MEDICAL EDUCATION

The interest and effort of the true physician has ever been to further the knowledge of the healing art, and to promote the well-being of his fellow man. One such purpose has been served for centuries past by teaching those who follow, and the other by instructing his patients. Out of this have grown medical schools, public health systems, and various agencies for study.

Over a half century ago, medical education was in a state of chaos. The title of "doctor" so impressed the public that patients did not look to discern how well qualified he was. Organized medicine undertook to improve and standardize medical

teaching. The result was that the public was taught to applaud the acceptable medical schools, while diploma mills were legislated out of existence, or withered for want of students. About the same time, laws to control licenses to practice were encouraged and eventually established in all states. This effort on the part of the various units of organized medicine brought immeasurable good to society as a whole and is responsible for an appreciable part of the present improved state of health. This is evidenced, among other things, by an increased life expectancy of about sixteen years since the beginning of the century. In the meantime, medicine has become more valuable to the citizen and he wants more of it. Because it is expensive, the Communists are whispering into his ear that he can have all he wants if he will just let them arrange for his neighbor to pay for it.

At this juncture, organized medicine finds itself in a position of striving to educate the public on medical values and at the same time fight off legislation calculated to socialize medicine and bring on a medical dictatorship. To these ends an educational campaign of the AMA has been applied. The effectiveness has been gratifying to all concerned. The local units of the Society have supplemented the national campaign, and brought the average citizen to the realization of his dangers. Our campaign now, however, is threatened from an additional source. This is the grants-in-aid program now being carried out by the Federal Security Agency, to various medical schools. These grants are for the purpose of research. This research will, of course, mean support of staff and in turn will mean federal control of staff. In addition to this process, which is already going on, bills are being introduced, which would have the effect of direct grants from the federal Government to medical schools, and indirectly to the students themselves. These expenditures by a prodigal government can only mean complete control of medicine by the government. Students will grow up with the idea that federal support and bureaucratic medicine are the proper way of



life. The potentialities in this field stagger the imagination. It need only be recalled that when Hitler set out to accomplish his diabolical ends he wasted little time on the static forms of German society as it then existed, but took over the labor unions and started the indoctrination of the youth in the schools and colleges.

The AMA has taken a definite stand against such subsidy and control of medical schools by the government. For effectiveness of this stand a positive move will be necessary. To this end, it is suggested that the AMA subsidize the medical schools. Startling as this may be at first thought, it is thoroughly within keeping of the aims and potentialities of organized medicine. It is obvious that the expenses of maintaining a medical school have outrun the endowed resources and the students' pocketbooks. In order to live up to the standards that all wish to maintain, outside assistance could come from no more proper source than doctors themselves. We can better be depended upon to keep our own house in order, than we could to maintain a semblance of order when dominated by politicians.

The requested contribution or assessment of \$25.00 from each member of the AMA brought in a huge fund of over \$2,000,000 which has been used in the general

educational campaign. This amount has been fixed as the dues for the members for the coming year. Medical dues in comparison to those of the monopolistic labor unions are strangely low. The average income in such unions will vary between \$2000 and \$5000 per year per individual. Recent figures have set the average income for the doctor at approximately \$10,000 a year. To maintain the right of private practice, the average physician could well afford to pay much more of his income into a fund to be used in the general interest than the average laborer. Such a fund in the hands of organized medicine could very quickly grow to a point where it would dwarf the pools of national labor unions. Among its services to the doctors and to the public could be the subsidy of the medical schools. Who would know their needs any better than ourselves? The temptation to squander public tax money would be absent.

Under these conditions, the schools would be receptive to principles of private practice, which in some areas is not the case now. Students would then look to organized medicine rather than to a prodigal government as the source of the funds which provided their education.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### DO NOT LAY DOWN YOUR ARMS

Recent developments in Washington, especially in the halls of Congress, and from the executive offices of the President indicate that the administration is preparing to put on one of the greatest fights in the history of this country to carry out their determination to federalize medicine. They have tried in a disguised manner to give the medical profession and the public sufficient opiate to desensitize them, by various rumors and expressions from lead-

ing senators *that there will be no action on federalization of medicine in 1950.* Do not let us be led into such a complacent disposition. Mr. Oscar R. Ewing, Director of Social Security, is not going to Europe just for his health. He is going there for the express purpose of seeing if it is possible to find some advantageous developments which would bolster up the cause of federalized medicine. Accompanying him on this trip are many of his satellites and co-workers who will spread all over Europe among the socialistic states to find out how well

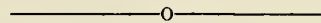
their compulsory medical plan is working. You may expect these individuals to bring back only those results which have been most appreciated by the public, and not the other side where medicine has been brought to the lowest ebb since civilization.

There are several bills now in a formidable position in the present Congress which, if acted upon favorably, will go a long way toward the enactment of federalized medicine. I particularly refer to Senate Bill No. 1411 known as the School Health Bill, in which it is proposed that the government examine and treat some 29,000,000 school children free of charge, without any consideration as to individual economic status. Senate Bill No. 1453 is of a similar nature, but provides benefits which give subsidy to medical schools after meeting certain qualifications for construction and enlargement of staff facilities, and this bill also provides a royalty to every student studying medicine. There is no test as to the economic status of the institution or of the individual medical student. Do we wish to have our public schools controlled and regulated by the federal government? Do we wish to have our medical schools and doctors subsidized? Do you wish them to be the pawns of the federal government? All of this would merely reduce to a minimum the independence of our institutions, as well as of the individual doctor.

We are sending the above message to you more or less in the spirit of warning you not to let up one iota in the wonderful work you have done in this state toward preventing passage of any compulsory health insurance. Probably the next two or three years will be much more trying and results more decisive than in any previous twenty years of medical history. We must stay united and fight with all the power we have; with honesty, integrity and assurance of our cause being the American way. This is a fight for the public to understand as the consequence of such tyrannical legislation would be most destructive to their freedoms and liberties and destroy free enterprise for all which we have been so proud of in the past. The successful passage of federalized

medicine is but a spoke in the wheel of the welfare state, which we must stop now or be in the tentacles of the octopus of the socialistic state. Attendance at national medical meetings during the past four or five months is very convincing that the medical profession is very conscious of the situation and is developing plans for a continuous fight to forestall the realization of victory by our opponents.

In the words of Mr. Oscar R. Ewing: "Our campaign plan is to educate each of the 3,000 Democratic precinct committeemen and women in all details of the National Health Insurance plan. They will explain it to the people." However, Dr. George F. Lull, secretary and general manager of the American Medical Association, states the following: "We will have to carry on this fight until someone is licked. It is false to ourselves and false to the medical profession to take the attitude that there is no need to continue an active campaign." So let's keep up the fight until the victory is won.



#### REPORT ON PROGRESS OF LOUISIANA PHYSICIANS SERVICE

It has just been three years since the committee on voluntary health insurance of the Louisiana State Medical Society organized Louisiana Physicians Service, Inc., the Blue Shield Plan. Through the establishment of this organization the doctors have been able to make available to the public a system of voluntary medical, surgical and obstetrical care.

The first contracts were issued November 1, 1946. Looking at their report at the end of operations on October 31, 1949, or just three years after the company was organized, we find that nearly 40,000 people are now covered and eligible to receive Blue Shield benefits. The income has increased considerably each year to where now the company will collect next year, more than \$300,000.00 in premiums, of which 70 to 80% of this amount will be distributed to the doctors of this state for services rendered the subscribers. During the three



year period 9,062 claims were presented for services performed by the doctors of this state. These claims amounted to nearly \$400,000.00.

The month of October 1949 was the largest single month for enrollment increase by the company. During October 5,382 persons were enrolled, 2,804 of these being through group enrollment and 2,578 persons being enrolled through the individual enrollment campaign conducted in late September and early October.

The first concentrated advertising campaign conducted by Blue Cross and Blue Shield was during the individual enrollment campaign. Newspapers throughout the state carried Blue Cross, Blue Shield ads for more than two weeks and radio stations throughout the entire state carried public announcements, urging people to en-

roll in Blue Cross, Blue Shield. Such advertising speaks for itself in increased enrollment as evidenced by the figures previously quoted.

The Council on Medical Service and Public Relations of the Louisiana State Medical Society participated actively in the advertising and promotion program for Blue Cross and Blue Shield.

The secretary of your society felt that this was an opportune time to present a brief report on Louisiana Physicians Service. A more detailed report will be rendered at the close of 1949. The Board of Directors of Louisiana Physicians Service has asked the Journal to express its sincerest thanks to all doctors throughout Louisiana for their wholehearted participation in the State Society's voluntary health insurance program.

## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

#### ANNUAL MEETING

##### SURGICAL ASSOCIATION OF LOUISIANA

The Surgical Association of Louisiana held its second annual meeting, at the St. Charles Hotel, on Friday, November 11, 1949. There were three papers in the morning and two round table discussions in the afternoon:

Relationship between Sex Hormones and Breast Carcinoma by Dr. Paul D. Abramson, Shreveport.

Certain Essential Considerations in the Management of Postoperative Thrombosis and Embolism by Dr. William H. Parsons, Vicksburg, Mississippi.

Annual address—Carcinoma of the Cervix by Dr. J. H. Pratt, Rochester, Minnesota.

Symposium—Acute Abdominal Emergencies.

Moderator—Dr. J. H. Pratt.

Associates—Dr. Lawrence H. Strug, Dr. Geo. Wm. Wright.

Symposium—Malignant Tumors.

Moderator—Dr. Ambrose H. Storck.

Associates—Dr. Wm. H. Harris, Jr., Dr. Samuel Romano, Dr. L. Sydney Charbonnet, Jr.

Dr. Isidore Cohn, New Orleans, was elected president for the coming year. Other officers elected are as follows: Dr. James Q. Graves, Monroe, first vice president, and Dr. Arthur N. Houston, New Orleans, second vice president; Dr. Henry G. Butker, New Orleans, secretary; Dr. Edmund L. Leckert, New Orleans, treasurer.

The members elected this year are: Dr. Charles L. Black, Shreveport; Dr. Henson S. Coon, Monroe; Dr. Claude C. Craighead, New Orleans; Dr. James H. Eddy, Jr., Shreveport; Dr. Marvin T. Green, Ruston; Dr. James E. McConnell, Monroe; Dr. Walter W. McCook, Jr., Shreveport; Dr. Richard E. C. Miller, Alexandria; Dr. Hollis T. Rogers, Winnsboro; Dr. Leonard H. Stander, Baton Rouge; Dr. Harry M. Trifon, Shreveport; Dr. Myron A. Walker, Baton Rouge; Dr. James S. Webb, Jr., New Orleans.

The growth and strength of the Surgical Association of Louisiana in the past year has been most creditable. It is serving a valuable purpose in promoting the standards of surgery and hospital care in our State. Its continued success is heartening.

## ANNUAL MEETING OF THE LOUISIANA ACADEMY OF GENERAL PRACTICE

The Louisiana Academy of General Practice held its annual meeting in Alexandria, on December 11 and 12, at the Hotel Bentley, Dr. D. B. Barber, president, presiding. The General Chairman of the meeting was Dr. C. P. Herrington of Alexandria. Doctors Esmond Fatter, New Orleans, Joel P. Gray, New Orleans; J. P. Sanders, Shreveport; John W. Atkinson, Gretna, were in charge of the commercial exhibits.

After registration there was a business meeting of the delegates, followed by dinner and an address of welcome by the president of the Eighth District, Dr. James Knoll, Bunkie.

On Monday, December 12, the following scientific program, arranged by the Chairman of the Program Committee, Dr. J. A. White, Jr., was presented.

Schizophrenia, by Dr. Howard G. Alexander, Staff, Central Louisiana Hospital, Pineville.

Mediastinal Tumors by Dr. E. C. Uhrich, Pathologist, Baptist Hospital, Shreveport.

Chronic, Nonspecific Ulcerative Colitis by Dr. Charles A. Jones, Chief, Department of Medicine, U. S. Veterans Hospital, New Orleans.

Pelvic Tumors that May Obstruct the Birth Canal by Dr. Sim B. Lovelady (recently Dept. Gyn., Mayo Clinic), Houston, Texas.

Ear, Nose, and Throat Allergy in General Practice by Dr. Jack R. Anderson, Staff of Eye, Ear, Nose & Throat Hospital, New Orleans.

Leprosy (with Kodachrome slides) by Dr. Rolla R. Wolcott, Senior Surgeon, U. S. Marine Hospital, Carville, La.

Socialized Medicine in England by Dr. Hugh Smith, Associate Professor of Orthopedics, Univer-

sity of Tennessee. (Dr. Smith spent six weeks in England recently on a commission making a study of this subject).

Diagnosis and Management of Occiput Posterior Position by Dr. E. L. King, Professor of Obstetrics, Tulane University, New Orleans.

## WOMAN'S AUXILIARY

After having been inactive over the summer months, the various local auxiliaries have begun their fall meetings. The Woman's Auxiliary to the Orleans Parish Medical Society met in October at the Orleans Club. Mrs. Herman Gessner, Medical Cultural Items Chairman, was the program chairman of the afternoon. She introduced Miss Mary Louise Marshall, librarian of the Rudolph Matas Medical Library of Tulane University, and assistant librarian of the Orleans Parish Medical Society. Miss Marshall spoke on "The Romance of Medicine in New Orleans."

The Woman's Auxiliary to the East Baton Rouge Parish met at the Woman's Clubhouse in October. The local points of interest were the committee reports and plans for next year's state convention. Also on the agenda was the showing of the Community Chest film, "This is Our Town."

The program of the first meetings of the Woman's Auxiliary to Rapides Parish Medical Society was devoted to a discussion of our publications. Mrs. O. B. Owens, editor of News and Views and immediate past president of the State Auxiliary, discussed both the National Bulletin and News and Views. She read excerpts from the bulletin, particularly in regard to the educational campaign being conducted by Whitaker and Baxter, and to the 12 point program of AMA.

Chairmen of publicity in the local auxiliaries are reminded to send notices of meetings to the State Chairman of Press and Publicity. Of interest, also, is information about special projects such as a Speakers Bureau and essay contests.

Mrs. Daniel M. Kingsley, Chairman, Press and Publicity.

## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

### WOMAN'S AUXILIARY TO THE LOUISIANA ACADEMY OF GENERAL PRACTICE

December 11 and 12 are red letter dates for the wives of General Practitioners in Louisiana. With their husbands who will meet in Alexandria at that time, they are going to be very occupied in making new acquaintanceships and renewing old friendships.

Except for the board members who will convene for a short session Sunday afternoon, the auxiliary is inaugurating a procedure of assembly without business meetings. Just come, attend a few parties, talk with your friends, and relax from the many,

many duties a doctor's wife is heir to.

Due to the fact that the convention date of the Louisiana Academy of General Practice has been changed to the fall so as not to interfere with attendance at the Louisiana State Medical Society meetings, traditionally held in the spring, there will be no necessity for business sessions for the entire group. The board of the L.A.G.P. has decided that the incumbent officers will serve the long term until the fall of 1950, so the women's group will of course follow the same procedure.

Enterprising Mrs. D. B. Barber, the president of the group, will enjoy the fortunate circumstance



of being able to relax as she presides at an assembly of auxiliary members in her own home town.

With the aid of her Louisiana state board members, Mrs. Barber corresponded with every state president where an Academy of General Practice was organized, with their wives, with every National Officer of the American Academy of General Practice, every board member, their wives also, gathering opinions as to the advisability of organizing a National Auxiliary at the meeting scheduled for February 21, 22 and 23 in St. Louis. The National Board discussed this question at the Mid-Year Board meeting, which was held in Kansas City in October, and decided that the Academy of General Practice was yet too young to sponsor an auxiliary.

Nevertheless the women of the Louisiana Auxiliary, the first in the nation to organize, feel that in the very near future, every state will have an organized auxiliary, which will of necessity initiate proceedings for national organization.

The aim of the auxiliary as presently organized is twofold; to promote the general practice program and to assist the doctor husbands with their projects, and secondly, to promote better acquaintanceship among the wives and families of the general practitioner.

The very informal program as planned for the

Alexandria conclave starts with a leisurely drive or train trip to Alexandria on Sunday. There will be only a board meeting for the women on Sunday afternoon, but the Presidents Barber (heads of the men's and women's group respectively) will entertain the member-friends of the dual organization at a cocktail party in the Bentley Hotel Sunday evening, to be followed by the traditional doctor-wife get together.

Monday the auxiliary members will lunch together with the afternoon free for shopping, chatting, resting or sight-seeing. Monday night in formal attire (for the ladies only) the final dinner meeting of the group will be held. This dress affair (which every woman loves) will be the only note of formality to the whole affair. Just come with your husband, whether or not you are a registered member of the state group. We'll see that you are asking to join before Monday noon.

Place—Alexandria.

Dates—December 11 and 12.

Who—Every general practitioner's wife in Louisiana.

Why—To be with your husband and to meet all the other G-P wives.

What—Just get together and fun. No business meetings.

Mazie Adkins Guidry,  
Publicity Chairman.

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## BOOK REVIEWS

*Outwitting Your Years:* By Clarence William Lieb, M. A., M. D., New York, Prentice-Hall, Inc., 1949, pp. 278. Price, \$2.75.

This is one of the many books purporting to act as guide to a healthier, happier life for the ageing and aged individual. The author has combined a thorough knowledge of the subject of geriatrics with good common sense and presented it in a witty, pithy fashion, readily understood by the layman.

I. L. ROBBINS, M. D.

*Marihuana in Latin America: The Threat It Constitutes:* By Pablo Osvaldo Wolff, M. D., Ph. D., M. A., Washington, D. C., The Linacre Press, Inc., 1949, pp. 56. Price, \$1.50.

The author of this monograph is a member of the Expert Committee on Habit Forming Drugs of the World Health Organization and apparently is in close touch with the problems of drug addiction in which he has been interested for a considerable period of time. Particular attention, in his discussion, is paid to the sociologic and especially criminal aspects of the marihuana habit. Most of the information concerns the conditions existing in Brazil, Mexico, and Cuba, although references are also made to the use of the narcotic in certain

other Latin-American countries and in the United States. On the whole, much more importance is attributed to the use of marihuana in the instigation of crime and in the promotion of mental and physical deterioration than has been given in certain other publications, notably that of the LaGuardia Committee based on a general survey and experimental study in New York City. There can be little doubt that the acute effects of the drug may lead in certain instances to the commission of crimes which would not otherwise occur and that the effects may be used by criminals as an abetting agent in carrying out premeditated crimes. The marihuana habit is also commonly encountered in habitual criminals. The author is also convinced that its chronic use leads to mental, moral, and physical deterioration involving the creation of criminal attitudes and acts.

In the opinion of the reviewer, conclusions regarding the relative importance of marihuana in the causation of crime encounter the same difficulties as those experienced with the use of alcohol. In other words, sufficiently reliable and extensive data must be obtained and then the data must be evaluated in its relation to the occurrence of crime as a whole. There is also the difficulty of determining the part played by other stigmata and extrane-

ous factors, such as mental defects, economic level and, environment, occurring concurrently in individual cases. Is the drug habit a primary cause of crime and criminal tendencies or is it but another manifestation of more deep-seated causes? These aspects are minimized by the author.

In addition to the above phase of the subject, useful and interesting information is also given on the wide extent of the habit, the general effects of the drug, and custom associated with its use. Distinction is made between this habit and true addiction produced by the opiates in that only slight tolerance is developed to marihuana and that dependence is mainly of a psychic and emotional type rather than physical. Throughout the monograph a very strong stand is taken on the dangers involved in the marihuana habit and the importance of eradicating it. An extensive bibliography is included.

RALPH G. SMITH, M. D.

*Interns' Manual:* By American Medical Association. Philadelphia, W. B. Saunders Co., 1948, pp. 201. Price, \$2.25.

This compact little volume, successor to "Hospital Practice for Interns," has been prepared by various Councils and Bureaus of the American Medical Association, and compiled and edited in the office of the Council on Pharmacy and Chemistry. It contains much useful information essential to the young intern, such as his place in the hospital, the lawful scope of his practice in each state, and the services of the American Medical Association available to him.

The clinical data comprise emergencies such as shock, diabetic coma, gastric hemorrhage, treatment of hemorrhage after tonsillectomy, etc. One chapter is devoted to acute poisoning, with description of symptoms and treatment of more than 50 types of poisoning. The latest uses and dosages of 248 proven drugs are given, with prescriptions, tables of solubility, and metric-apothecary equivalents. Standard tests are included, and normal values are given for blood, urine, spinal fluid, and gastric contents. Many diet tables are included.

I. L. ROBBINS, M. D.

*Cardiovascular Disease:* By Louis H. Sigler, M. D., F. A. C. P., New York, Grune & Stratton, 1949, pp. 551, illus. Price, \$10.00.

This book offers an excellent review of the significant factor concerning various features of cardiovascular disease. The author has successfully achieved his objective of covering the field of cardiovascular disease with emphasis on the pathologic physiology of disease as elucidated in the investigations of the past few years and the treatment of the patient as an individual with particular reference to psychosomatic aspects of his disease. Of particular interest are the first three chapters concerning the general incidence and types

of cardiovascular disease as well as a fairly detailed presentation of the anatomy and histology of the heart and blood vessels. These data are not usually found in textbooks of cardiology.

The rather frequent generalizations, which are at times inaccurate, are a poor feature of the book. Nevertheless, the book is recommended to anyone who desires an easily read review of cardiovascular disease written from the clinical standpoint.

FRANK J. KELLY.

*American Nurses' Dictionary; the definition and pronunciation of terms in the nursing vocabulary:* By Alice L. Price, B.S., R.N. Philadelphia, W. B. Saunders Co., 1949., pp. 655 plus 101. Price, \$3.75.

Included in this medical dictionary are approximately 25,000 words chosen primarily to meet the requirements of the nurse. Pronunciation and definition are given clearly and concisely. No etymology is included. Appendices contain lists of abbreviations commonly used in medicine, prefixes, suffixes, symbols; tables of the arteries, bones, chemical elements, muscles, cranial nerves and the veins.

Supplementing the Dictionary is a Teacher's Vocabulary guide in pamphlet form in which are grouped by subject the most important words which the nurse should know.

This volume will fill a very useful purpose.

MARY LOUISE MARSHALL.

*Handbook of Orthopaedic Surgery:* By Alfred Rives Shands, Jr., B.A., M.D. 3rd ed. St. Louis, The C. V. Mosby Company, 1948, pp. 574. Illus. Price, \$6.00.

The author states in the preface of this third edition that his book has become more or less the standard text for teaching of graduate and undergraduate orthopedic teaching, as well as being used extensively by the general practitioner as a reference book in orthopedic surgery. The third edition represents considerable expansion over the second edition with the re-insertion of numerous illustrations which were deleted from the second edition, having appeared only in the first edition of the book. The illustrations are of good quality, although the use of drawings to depict x-ray changes is no more successful here than they are elsewhere in medical literature. The material in the text is presented concisely and in a definite outline form which lends itself very well to its use by undergraduate students. One of the most valuable features of the instruction to students is the illustration of improper methods of immobilization or positioning of patients, as compared to the proper method of immobilizing patients, with an



excellent discussion of the reason for the positions of immobilization, as illustrated.

The incorporation of extensive material from current literature and the compilation of an accurate and extensive bibliography increase the value of this text to the students immeasurably.

JACK WICKSTROM, M.D.

*Physician's Handbook*: By John Warkentin, Ph.D., M.D., and Jack D. Lange, M.S., M.D. 5th ed. Palo Alto, Calif., University Medical Publishers, 1948. Pp. 294, illus. Price, \$2.00.

This handbook summarizes diagnostic procedures and factual data which a physician must have quickly available. The scope of the 5th edition has been extended in order to be a serviceable pocket-reference for many types of medical practice. Most of the standard laboratory and clinical tests are included.

In this revision the authors have given emphasis to clinical factors, such as the significance of laboratory test findings. This is evidenced in the sections on the comatose patient, urine, blood and liver tests, the hormones, and diagnosis of poisoning. An autopsy outline and treatment of acute poisoning and alcoholic intoxication have been added. Simplifications of older tests are also included, such as the "newspaper test" for urine sulfonamides.

I. L. ROBBINS, M.D.

*Clinical Auscultation of the Heart*: By Samuel A. Levine, M.D., and W. Proctor Harvey, M.D. Philadelphia, W. B. Saunders Co., 1949. Pp. 327. Illus. Price, \$6.50.

The authors state in the preface of this treatise that they have been impressed by the fact that many physicians, not only general practitioners but also able internists and even cardiologists, were not applying all the information that can be obtained by simple auscultation. For this reason they be-

lieved that this detailed discussion of bedside auscultation would be timely. The reviewer is sure that those physicians who read the book will agree.

The authors discuss normal heart sounds and deductions which may be made from changes in character of these sounds. They discuss the recognition of the various cardiac arrhythmias by bedside auscultation, the interpretations possible from different murmurs and numerous miscellaneous auscultatory findings such as venous hums, Duroziez's signs, etc. The various acoustic phenomena are discussed along with the clinical significance of the particular finding. Illustrations by actual sound tracings greatly clarify the presentation and add much to the book.

Any physician who carries a stethoscope will find reading this concise, well illustrated monograph a valuable experience.

CHARLES E. JACKSON, M. D.

#### PUBLICATIONS RECEIVED

Charles C. Thomas, Springfield, Illinois: *The Diagnosis and Treatment of Adrenal Insufficiency* by George W. Thorn, M.D., with the collaboration of Peter H. Forsham, M.D., and Kendall Emerson, Jr., M.D. *Resuscitation and Anesthesia for Wounded Men*, by Henry K. Beecher, A.M., M.D.

W. B. Saunders, Philadelphia: *Normal Values in Clinical Medicine*, by F. William Sunderman, M.D. and Frederick Boerner, V.M.D. *Diseases of the Heart*, by Charles K. Friedberg, M.D. *The Eye and Its Diseases*, by Ninety-Two International Authorities, Edited by Conrad Berens, M.D., F.A.C.S., 2nd Edition. *An Atlas of the Blood and Bone Marrow*, by R. Philip Custer, M.D.

John C. Winston Company, Philadelphia: *For the New Mother*, by Mildred V. Hardcastle, R.N.

Froben Press, Inc., New York: *Your Nasal Sinuses and Their Disorders*, by Albert P. Seltzer, M.D.

# New Orleans Medical

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### SYMPOSIUM ON LESIONS OF THE SMALL BOWEL

#### DISEASES OF THE JEJUNUM AND ILEUM; DIAGNOSIS AND TREATMENT

HERBERT L. WEINBERGER, M. D.

NEW ORLEANS

Some years ago students were permitted to omit the study of diseases of the small intestine. I refer to that part of the small intestine from the ligament of Treitz to the ileocecal valve. This part of the tract was regarded as relatively free from pathological changes, and of those diseases recognized, knowledge was extremely limited. In more recent years much has been added to the literature in the study of inflammatory diseases of this portion of the small intestine.

In the early days little was known of the syndrome known as sprue, supposedly confined to tropical zones. Steatorrheas, deficiency states, and avitaminoses, as affecting the small bowel were unknown.

#### NUTRITIONAL DISTURBANCES

Sprue, as it is known today, is not considered just a nutritional disease of the tropics. Most investigators consider tropical and nontropical sprue as probably the same disease with few differences. Herter's infantilism is a similar disease in children, and Gee-Thaysen's disease is the same disease entity in adults. They all may be in-

cluded under the heading of idiopathic steatorrhea.

Miller and Rhoades,<sup>1</sup> Castle,<sup>2</sup> and Mackie,<sup>3</sup> consider these syndromes, the most typical of which is sprue, as nutritional disturbances, and vitamin deficiencies. Weight loss, inability of the small bowel to absorb lipids, glossitis, and stomatitis are usually found in cases of this syndrome.

There are some differences of opinion as to whether celiac affection in children is identical with the disease in adults, and whether the syndrome developing in the tropics is of a different nature from that arising in other areas. It seems certain that whenever and however the sprue syndrome may arise, the fundamental defect is one of intestinal absorption. There have been similar symptoms observed in two groups of conditions in which the pathologic cause of the absorptive difficulty may be demonstrated; one group represents a short circuiting of food from upper to lower part of the gastrointestinal tract.<sup>4-5</sup> A similar abnormality has been produced in dogs by resection of all or part of the small intestine.<sup>6</sup>

These syndromes are most often associated with a macrocytic anemia. A decalcification and rarefaction of bone may take place due to loss of calcium. This loss of calcium is due indirectly to the inability of the bowel to absorb fats; fatty acids and soaps combine with the calcium and are passed out.

With the loss of lipids from the stool, there is also a loss of the fat soluble vitamins. Vitamins A, D, and K, depend upon

Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 7, 1949, in New Orleans.



their solubility in fats for intestinal absorption. The deficiency in A may result in epithelial changes; with D deficiency, calcium and bone rarefactions; with K deficiency, a tendency to hemorrhage.

Crohn<sup>7</sup> reports no distinct or constant pathologic changes in the small intestine of man in the advanced or fatal cases of sprue. Thaysen,<sup>8</sup> Mackie and Fairley,<sup>9</sup> (8 cases), and Snell,<sup>10</sup> (3 cases), found no distinctive gross, or microscopical changes in the wall of the small intestine. Grossly, there has been noted some thinning of the bowel wall. Crohn<sup>7</sup> further reports that there is some congestion and the villi appear shrunken and almost acellular. Except for round cell infiltration, no microscopic changes are noted. At times there may be superficial ulcerations, but the process is not one of inflammation and certainly not granulomatous.

Castle and Rhoades<sup>11</sup> suggested that in sprue there is a deficiency of an intrinsic factor, possibly resident in the secretion of the stomach or in the wall of the small bowel, or in both. This intrinsic factor, they further suggest, controls and makes possible fat absorption from the bowel, fat utilization by the liver, and normal hemopoiesis. As in pernicious anemia, we have an achylia, and frequently an atrophy of the gastric mucous membrane associated with the loss of the intrinsic factor. It is thought that the achylia is not the primary factor, but rather the atrophy of the mucosa, in causing the loss of the intrinsic factor. In sprue, Crohn<sup>7</sup> suggests that the atrophy that does occur is part of the pathological picture. It may or may not be the cause of the disease, but rather may be the result of the loss of the intrinsic factor, which controls fat absorption and blood formation. Miller and Rhoades suspected that a diet deficient in vitamin B was responsible for the atrophy and the lack of elaboration of the intrinsic factor.

Miller and Rhoades<sup>1</sup> subjected young swine to Goldberger deficiency diet such as is used to produce black tongue in dogs. These animals all developed stomatitis, achlorhydria, and anemia, as well as diar-

rhea, fatty stools, and signs of peripheral nerve injury. The anemia was of the hypochromic type. The administering of vitamin B<sub>1</sub>, to control animals, prevented the above.

The degree of anemia in sprue does not parallel and is not consistent with fluctuation in gastric secretion.<sup>1</sup> The deficiency in hemopoiesis seems to be more related to atrophic changes and the existence of the intrinsic factor in the bowel wall.

Radiographic changes have been described that note disturbances in physiology and anatomy of the upper small intestine, as characteristic in sprue.<sup>11-14</sup> The changes described consist of alterations in the mucosal relief with segmentation and clumping in the upper loops, and evidences of delayed motility. The barium is clumped in masses with the contour of the bowel smoothed out. Ross Golden<sup>15</sup> noted radiological changes in the small intestine (mainly in the jejunum) in 7 out of 11 cases of celiac diseases in children, and in 3 cases of idiopathic steatorrhea in the adult. He noted the same tendency of the barium to isolate itself into segments. Kantor<sup>17</sup> coined the term "moulage sign" for the appearance of the bowel in cases of steatorrhea, the appearance being that of wax in a smooth container.

The diagnosis of sprue is difficult, as the condition may be overshadowed by other nutritional disturbances. Tropical and nontropical sprue are probably the same conditions; the latter being probably more chronic than the former. In sprue, we have either normal free hydrochloric acid in the gastric secretion or else a hypochlorhydria, rarely an achlorhydria. Whereas normal stools contain about 28 per cent fat, stools of patients with sprue have about 70 per cent. Blood calcium and phosphorus are low in sprue. The glossitis, steatorrhea, wasting, weakness, anemia, abdominal distention, and disturbances of calcium and phosphorus metabolism are typical of this syndrome.

The x-rays of the small intestine in sprue, as described by Castle and Rhoades,<sup>11</sup> Snell,<sup>12</sup> Mackie and Pound,<sup>13</sup> Miller and

Baker,<sup>14</sup> are typical. Tuberculous enteritis, enterocolitis and chronic pancreatitis may be differentiated by a study of the history and symptomatology.

The treatment of sprue and its associated allied conditions is more or less the same: Rest in bed, diet low in fats and carbohydrates, high in red, rare meats. Folic acid and B<sub>12</sub>, have been reported as very effective. Bananas are recommended. Calcium and phosphorus should be included in the medication. Very intense liver extract therapy should be administered.

#### VITAMIN DEFICIENCY STATES

Nutritional and vitamin deficiency states affect the small intestine. Deficiency pattern of the small intestine may complicate such conditions as chronic ulcerative colitis, idiopathic steatorrhea, nephrosis, and diabetes insipidus.<sup>18</sup> Vitamin B deficiency, particularly those associated with achlorhydria, may present a picture with anemia, pellagralike dermatitis, peripheral neuritis, and diarrhea. They are further associated with disturbance in fat absorption, so symptoms of calcium deficiency may be present prior to definite signs of vitamin B deficiency. Histological changes in the small bowel have not been established.

Characteristic roentgenological changes are demonstrated in the jejunum, the valvulae conniventes are broadened, the spacings widened and irregular in size. Dilation and stagnation takes place in the upper jejunal and ileal segments. There is a delayed filling in the jejunal loops, while the intestine proximal to and distal from this pooled area is relatively free from barium. In later plates (three to four hours), the ileal loops may present a sausage shaped arrangement. These changes are probably due to edema and changes in the muscular tonus.

Apparently this so-called deficiency pattern then is fairly consistent in sprue and other steatorrheas. Deficiency states of various types tell us a story. This story is simply that these conditions have one thing in common, an inability to absorb vitamins necessary for normal state of tonus, secretory activity, and absorption.

The motility of the small intestine, according to Golden,<sup>19</sup> varies with the severity and duration. Early in the deficiency there is a marked hypermotility through the small intestine. This is associated with a hypertonicity. Later in the course of the disease Golden found a hypomotility with a hypotonicity in the small intestine.

The differentiation of the various fundamental causes of abnormalities of the small bowel is impossible. They may be due primarily to lack of vitamins, hypoproteinemia, or disease of the liver. Golden's<sup>19</sup> cases were relieved by parenteral or oral administration of liver extract and vitamin B complex. There was improvement in intestine function as noted by radiographic examination in each case appropriately treated for vitamin deficiency.

#### INFLAMMATORY DISEASES

Acute enteritis is a diagnosis that is really made by inference and by exclusion. History is important in making this diagnosis. Others in the family may be simultaneously affected, pointing to some food or like poisoning. Food and drink are the frequent offenders in producing acute enteritis. The eating of decomposed, fermented, or putrified foods accounts for many epidemics of acute enteritis. Alcohol taken in excessive amounts or by susceptible persons is a frequent cause. Certain medicines such as drastic cathartics, salicylates, cinophens, and such poisons as arsenic, lead, and mercury, may produce an acute enteritis.

Deficiency states, allergy, psychoneurosis, or achlorhydria, may be predisposing causes. The presence of free hydrochloric acid in the gastric contents acts as a protection against certain pathological organisms. Acute enteritis may be secondary to acute infectious diseases.

Acute enteritis is characterized by acute onset of intestinal symptoms, both upper and lower. Slight nausea is followed by vomiting, diarrhea, more or less, with or without fever. There is abdominal discomfort usually crampy in type, and associated with borborygmus. Physical findings present general soreness of the abdomen. Stool



cultures are usually negative for the dysentery groups of organisms. Stool examinations are generally negative for ameba, or other parasites. Sigmoidoscopic examinations may reveal no change in the mucous membrane unless the attack has been prolonged, then there may only be some mild congestion or edema of the mucous membrane of the rectum and sigmoid. This usually is due to trauma of many stools.

After acute surgical conditions have been excluded, the treatment should be directed towards cleansing the gastrointestinal tract. Castor oil seems to be the laxative of choice. The diet should be simple. For the first twenty-four hours, tea, black coffee, clear broth, dry toast, should be given. After this, we gradually add soft, nonirritating foods such as gelatin, cooked cereals, soft eggs, custards, mashed potatoes, rice, and pureed vegetables.

In severe cases parenteral fluids may be given. Occasionally small doses of purgative may be needed to relieve intestinal cramps after the purgative has been effective. Sulfathaladine given in gram doses seems to reduce the fermentative organism. Occasionally pectin, bismuth, kaolin, and belladonna are indicated to relieve tenesmus.

The diagnosis of chronic enteritis to account for symptoms related to the small intestine is rarely made. This condition may be just the results of a protracted acute enteritis or secondary to other chronic intestinal disturbances such as prolonged constipation or ileal stasis. Hypermotility of the gastrointestinal tract associated with functional disturbances may predispose to chronic enteritis.

The treatment of chronic enteritis is directed towards the condition which seems to produce this state. Usually a nourishing bland, low residue diet, well fortified with vitamins is given. Hydrochloric acid should be prescribed if achlorhydria is present. Again, the diarrhea may be relieved as in acute enteritis.

The small intestine may be the seat of allergic reaction as demonstrated by the following cases:

#### CASE REPORTS

Case 1. H. J. B., male, age 10 years. Current complaint, abdominal pain.

Present illness: Severe pain around umbilicus, usually one hour after eating. Pain associated with nausea, but no vomiting. Loss of 1½ pounds in weight in the past month. Treatment consisted of antispasmodics and psychotherapy to no avail.

All laboratory findings, including blood count, gastric analysis, and urine analysis, were within normal limits.

Physical examination: Marked tenderness above umbilicus. Impression of small masses palpable just above and below the umbilicus.

X-ray at Touro Infirmary: Gastric and intestinal motility so rapid that within twenty minutes after ingestion of meal, head of the column was in the colon.

Surgery: Dr. J. D. Rives opened abdomen and noted recurrent intussusceptions of jejunum. No tumors were palpated. Abdomen closed.

Treatment: Elimination diet: With the elimination of milk, all subjective and objective symptoms disappeared.

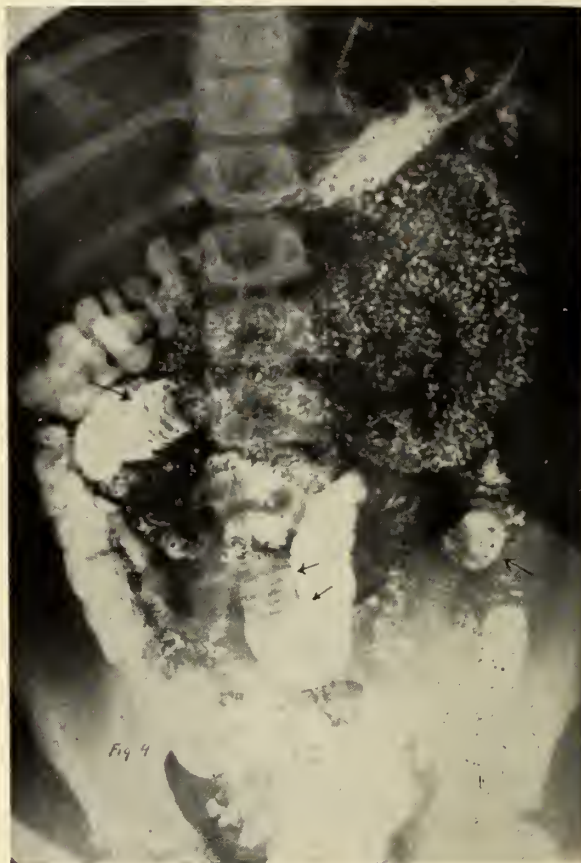


Figure 1.

Case 1—Intussusceptions of the small bowel.

Case 2. C. H., female, age 8 years. Current complaint: Pains around umbilicus.

Present illness: Onset one year ago with pains

around the umbilicus,—periodic. Occasional nausea and vomiting. Bowels moved daily. Attacks usually four or five times daily. The pain did not interfere with play.

All laboratory findings including blood count, gastric analysis, and urine analysis, were within normal limits.

Physical examination: Abdomen, marked tenderness below the umbilicus.

X-ray at Touro Infirmary: Serial fluoroscopy and films of the small intestine reveal hypermotility and abdominal segmentation, multiple unquestionable short segmented intussusceptions are visible.

Treatment: Elimination diet. With the elimination of milk, and a low residue diet, and with the use of elixir benadryl, produced complete relief.

In this last case, there was a question of some possible psychoneurosis producing a neuromuscular imbalance, but again antispasmodics and psychotherapy produced no results.

Case A. J. T., male, 49 years of age. Current complaint: abdominal pain.

Present illness: Pains in the right lower quadrant for the past three years, usually fifteen to thirty minutes after meals, lasting about two or three hours. Pain was so sharp that patient had to stop all activity and sit down. Lost 25 to 30 pounds. Low grade fever. He noticed "lumps" in the lower abdomen relieved by massage. Pain

worse during constipation, but had bouts of diarrhea.

Physical examination: Abdomen—oblong mass (very tender) palpated in the lower right quadrant. This was freely movable.

All laboratory reports such as blood count, urine, liver function tests, serology, culture from stools, were within normal limits.

X-ray of small bowel: (Touro Infirmary) Interval fluoroscopy and films of the small bowel reveal some delay in transport in pelvic ileum. Proximal small intestine is normal. A segment of terminal ileum is constantly narrow and exhibits a degree of flexibility and distensibility which weighs against neoplasm (lymphoblastoma) and favors a chronic inflammatory process. Hypothesis nonspecific regional ileitis.

Surgery: Ileum involved for 8 inches up from ileocecal valve. Mesentery edematous. Ileotransversostomy done.

Crohn, Ginsburg, and Oppenheim, in 1932, segregated from the miscellaneous group of benign nonspecific granulomas 13 cases which exhibited a necrotizing and cicatrizing inflammation. They used the term "regional ileitis" to designate this pathologic and clinical entity.

The clinical features of regional ileitis are the presence of diarrhea, lower abdominal pain, fever, loss of weight, and anemia. As the disease progresses, a mass may be palpated in the lower abdomen, usually to the right. This condition may advance to partial or complete obstruction. Crohn<sup>7</sup> described fistulous tracts that may be formed between this regional ileitis, the rectum, or possibly to the exterior.

This same process may be found anywhere along the small bowel and has been termed segmental ileitis. Crohn<sup>7</sup> also described a clinical entity which resembles regional ileitis very closely. This condition he terms ileojejunitis. It is characterized by the same clinical symptoms as regional ileitis, but there is no palpable mass, no tendency towards fistula formation, nor are there found any obstructive symptoms or signs.

The diagnosis of regional ileitis is mainly dependent upon x-ray examination. In the early phase of the disease, even the x-ray may be of little help in the diagnosis. The presence of the "string sign" described by



Figure 2.

Case II—Regional Ileitis.



Kantor and others, with some dilatation of the proximal loops of the small bowel are very suggestive of regional or segmental ileitis.

Often a diagnosis of acute appendicitis is erroneously made. The differentiation from malignant tumors may be made by a shorter history, age of patient more advanced, greater anemia, firmer and more nodular mass, and the roentgen defect more circumscribed. Many benign tumors, and tuberculous enteritis may resemble regional ileitis clinically and radiologically. This may only be differentiated by laboratory examination.

Treatment of the acute case may be conservative early. The chronic case of regional ileitis requires surgery. Those cases: (1) producing obstruction, (2) with fistula formation, (3) with abscess formation, (4) with perforation and peritonitis, require immediate surgery.

The type of surgery is a controversial issue. Mortality seems equally as great with side-tracking operation as with resection.

Tuberculosis of the small intestine is just an incident in a widespread disease. It occurs in most cases of generalized or advanced cases of pulmonary tuberculosis. The lymphoid tissue of the bowel is where the lesion usually begins. The lower ileum and ileocecal areas are the usual sites for tuberculosis involving the small bowel.

Local or constitutional symptoms predominate, with fever, malaise, weakness, anorexia, and loss of weight. Abdominal discomfort is manifested by abdominal cramps and perpetual diarrhea. Physical examination usually reveals extensive pulmonary tuberculosis; generalized abdominal tenderness with finally a "doughy feel" to the abdomen.

Diagnosis of tuberculosis of the small bowel can only be confirmed by the finding of tuberculosis elsewhere. Radiological study of the gastrointestinal tract is of help. The Stierblin sign, which is the failure of the cecum and the ascending colon to retain barium is suggestive. The segmentation

of the coils of the small intestine with dilatation of some loops, in conjunction with finding of tuberculosis elsewhere in the body are fairly indicative of tuberculous involvement of the small intestine.

The treatment of small intestine tuberculosis is general. Rest, fresh air, high vitamins, high caloric diet, are essential. The diarrhea may be controlled with pectin, bismuth, kaolin, or the opiates. Streptomycin with para-aminosalicylic acid may be of help.

Primary tumors of the small intestine are quite rare. The diagnosis can only be suspected in cases of obstruction or bleeding. The small intestine barium series will establish the diagnosis in a high percentage of cases. The treatment is surgical.

#### PARASITIC

The small intestine is the resting place of certain parasites such as *Giardia lamblia*, *Necator americanus* (hookworm), *Strongyloides stercoralis*, and *Ascaris lumbricoides*. These may cause various and sundry upper and lower gastrointestinal disturbances. The ascaris have been known to appear in such numbers that they may produce an intestinal obstruction.

The diagnosis of intestinal parasites depends upon finding the ova or parasites in the duodenal drainage or in stool examinations. The treatment is specific: for *Giardia lamblia*, atabrine; for hookworm, tetrachlorethylene, thymol or carbon tetrachloride; for strongyloides, gentian violet; for ascaris, hexylresorcinol, santonin, or oil of chenopodium.

#### DIVERTICULA

Diverticula of the small intestine are rare, and when present, are usually in the jejunum. They may produce vague abdominal pains and flatulence. Occasionally, a diverticulosis will produce an ulcer-like syndrome. The diagnosis is made by roentgenological study of the small intestine.

The treatment of diverticulosis of the small intestine is usually conservative, strict low residue diet, rest, mineral oil, antispasmodics. Surgery is reserved for the complication, including inflammation, obstruction, and perforation.

A congenital out-pouching of the ileum, or remnant of the omphalomesenteric duct was described by Meckel. Symptoms are rarely caused by this remnant unless complications arise. These complications may be: (1) acute inflammation; (2) perforation from ulcer or impacted foreign body within the pouch; (3) obstruction due to the incarceration of a loop of bowel in, under, or around the cord extending from the diverticulum; (4) may become adherent within a hernia sac.

All the symptoms and signs of an acute abdomen associated with or without obstruction may be attributed to Meckel's diverticulum. The x-ray diagnosis is very difficult. The diagnosis is usually made at surgery.

#### SUMMARY

1. Sprue, Herter's infantilism, Gee-Thayson's disease, and idiopathic steatorrhea are nutritional disturbances associated with inability of the small bowel to absorb lipids. Castle described lack of the intrinsic factor in the small bowel wall as the cause. This syndrome produces typical radiological changes in the small bowel pattern. Treatment consists of the use of folic acid, B<sub>12</sub>, parenteral liver extract, diet low in fats and carbohydrates, but rich in rare meats.

2. Nutritional and vitamin deficiency may affect the small intestine. Anemia, dermatitis, peripheral neuritis, and diarrhea may result. These deficiencies produce a typical radiographic "deficiency pattern" in the small intestine. Administration of deficiency substance results in return of small intestinal function.

3. Acute enteritis is a diagnosis made by inference and exclusion. There are many predisposing and primary causes, including decomposed foods, excessive alcohol, drugs, and poisons. Treatment after excluding surgical conditions is use of castor oil and nonfermenting, low residue diet.

4. Chronic enteritis is diagnosis which is rarely made. The condition is usually the result of protracted acute enteritis.

5. Regional ileitis or segmental ileitis is a term used to describe a benign granulo-

matous condition of the small intestine which has a tendency to exhibit a necrotizing and cicatrizing inflammation, and produces abdominal pain, fever and diarrhea. Occasionally a mass may be palpated in the lower abdomen. Radiographic studies are fairly suggestive with presence of "string sign". Treatment is usually surgical.

6. Tuberculosis of the small intestine is secondary to tuberculosis elsewhere in the body, usually pulmonary. Small bowel involvement brings about abdominal cramps and diarrhea. Treatment is general.

7. Primary tumors of the small intestine are rare. Tumors manifest themselves in bleeding or obstruction. Diagnosis is made usually by x-ray. Treatment is surgical.

8. The small intestine is the resting place of certain parasites. They are *Giardia lamblia*, hookworm, ascaris, and strongyloides. Diagnosis is made by stool examinations. Treatment of each is specific.

9. Diverticula of the small intestine are rare. They may produce vague abdominal pains. Diagnosis is made roentgenologically. Treatment is usually conservative. Complications are met with surgery.

10. Meckel's diverticulum is a congenital out-pouching of the ileum, and rarely produces symptoms without complications. These complications are those of an acute abdomen. Treatment is surgical.

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## PATHOLOGY OF CERTAIN INFLAMMATORY LESIONS AND NEOPLASMS OF THE SMALL BOWEL\*

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The purpose of this paper is to present primarily the gross pathologic changes of those inflammatory lesions and neoplasms of the small bowel, in which the findings are characteristic and, at times, pathognomonic. Where pathogenesis contributes to the better visualization of the final gross lesion, it will be summarized.

### A. INFLAMMATORY LESIONS

1. *Bacillary dysentery.* While the lesions of bacillary dysentery are most frequent and severe in the sigmoid and rectum, Macumber<sup>1</sup> in a study of 31 autopsy cases found the small intestine, especially the ileum, also involved in 71 per cent. Early, the lymph follicles are enlarged and appear as gray grains of sand on a red background of inflamed mucosa. Later, the follicle centers become necrotic, resulting in multiple small ulcers, which may coalesce and form widespread zones of discrete and confluent ulceration. The ulceration is characteristically superficial, extending only to the submucosa. The mucosa be-

tween the ulcers is red and edematous. In approximately 45 per cent of these cases, there is a pseudodiphtheritic membrane, comparable to the tough fibrinous membrane in the upper respiratory tract in diphtheria. The bowel wall, particularly the submucosa, is edematous.

In dogs and rabbits, Penner and Bernheim<sup>2</sup> have shown that the toxin of the Shiga strain of the dysentery bacillus has no effect on direct contact with the intestinal mucosa. The lesions in the intestinal tract, produced both by intravenous injection and by intestinal absorption of the Shiga toxin, are interpreted as the anatomic end result of prolonged and severe vasoconstriction in the intestine. The latter occurs as a compensatory response to the shocklike circulatory state, following injection or absorption of the Shiga toxin. This explanation is corroborated by their finding that in tissue cultures the concentration of Shiga toxin necessary to inhibit growth and kill explants of intestinal mucous membrane is extremely high. It is probable that in some cases in man a similar pathogenesis of the lesions is operative.

2. *Typhoid fever.* In 78 large cities in the United States, the annual death rate from typhoid per 100,000 population has decreased from 20.54 in 1910 to 0.34 in 1941.<sup>3</sup> The disease is thus of less importance at present than a few decades ago.

The intestinal changes in typhoid fever are most prominent in the small bowel, particularly the ileum. The character of these lesions depends on the duration of the disease. During the first week, there is swelling of the lymphoid follicles and Peyer's patches.<sup>4</sup> The adjacent mucosa is hyperemic and edematous. At the beginning of the second week, small foci of coagulation necrosis appear in the hyperplastic lymphoid tissue (Fig. 1). About the middle of the second week, the necrotic tissue sloughs out and an ulcer is formed. Typically, the long axis of the larger ulcers is parallel to the long axis of the intestine. This is the result of their origin in Peyer's patches. Numerous small round ulcers originate in solitary lymphoid follicles. By the begin-

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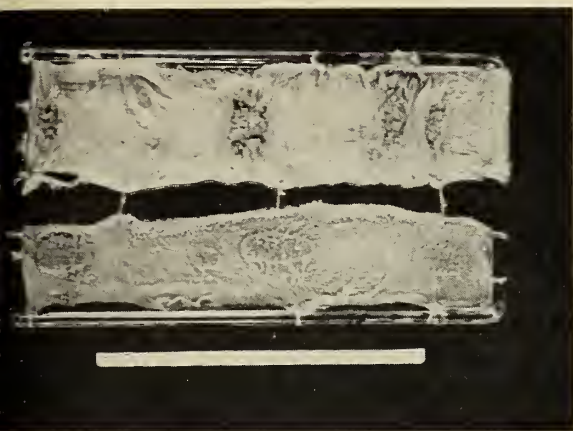


FIG. 1. Tuberculous enteritis (above) and typhoid, (below). The Peyer's patches and solitary lymphoid follicles in the typhoid lesions are greatly swollen and show beginning ulceration. The long axis of the ulcers is parallel to the long axis of the bowel. The tuberculous ulcers are irregular and are roughly transverse ("Girdle ulcers") to the long axis of the intestine.

ning of the third week, the height of the inflammatory process has been reached. The ulcers are sharply punched out and slightly undermined. Their bases are smooth. It is in this stage that hemorrhage and perforation are most likely to occur. Toward the end of the third week, healing begins. Hyperplastic lymphoid tissue fills the defect and epithelium covers the surface. A scar forms, if the ulcer has been deep.

3. *Tuberculosis.* Tuberculous enteritis may be primary or secondary. The incidence of primary tuberculous enteritis has fallen sharply due to pasteurization of milk and inspection of cows. In a survey of case records at the Cleveland City Hospital, Reichle<sup>5</sup> found a ratio of 1 primary intestinal infection to approximately 17 primary in the lungs. In a small number of cases with caseous or calcified lesions of mesenteric lymph nodes, a healed and calcified lesion of tuberculosis may be found in the intestine, usually the terminal ileum.<sup>6</sup> These tuberculous lesions of the intestinal wall and adjacent lymph nodes are comparable to the primary complex in the lung and tracheobronchial lymph nodes. With a primary complex in the intestine and mesentery, lesions of a first infection in the

lung are likely to be absent. The intestinal lesion may be overlooked or it may heal completely. Failure to find it should not be incorrectly interpreted as evidence that tubercle bacilli have passed through the intact intestinal wall to the mesenteric lymph nodes.

Secondary tuberculous enteritis is present in approximately 70 per cent of fatal cases of pulmonary tuberculosis.<sup>7</sup> The patient swallows sputum loaded with tubercle bacilli, which then invade the intestinal mucosa. Less commonly, bacilli reach the intestine by the blood stream, or by direct or lymphatic extension from a primary focus of infection elsewhere.

The ileum is involved in 89 per cent of cases.<sup>7</sup> The abundant lymphoid tissue, the large surface area of the villous folds, and the slowed fecal stream probably favor the implantation of the bacilli in this site. In the lymphoid tissue of the mucosa and submucosa, the bacilli proliferate, evoking characteristic tubercle formations. The area undergoes necrosis and the necrotic material sloughs out. The resulting ulcers are irregular and discrete. The bacilli spread through the lymphatics, running circumferentially in the submucosa and subserosa of the bowel wall. The typical "girdle" ulcers are thus produced. Their long axis is transverse to the long axis of the intestine (Fig. 1.) Adjacent ulcers often become confluent. Frequently, there are tubercles in a linear pattern along the lymphatics in the serosa. The bowel wall may be thickened at these sites. The ulcers perforate in about 4 per cent of cases.<sup>7</sup> On the other hand, they may regress and even heal with fibrosis and partial or complete epithelial regeneration. The mesenteric lymph nodes frequently contain tubercles and caseous foci.

4. *Syphilis.* In a series of 8,856 consecutive autopsy records at Charity Hospital in New Orleans (1929-1937), 3 cases of intestinal involvement in congenital syphilis were found.<sup>8</sup> These constituted 1.3 per cent of the 230 cases of syphilis in infants who came to autopsy. Approximately half of these in-



fants are stillborn; 27 per cent live twenty-four hours; and only very few reach the age of two or three years. The most common lesion is a raised yellow plaquelike band, encircling the bowel (Fig. 2). There

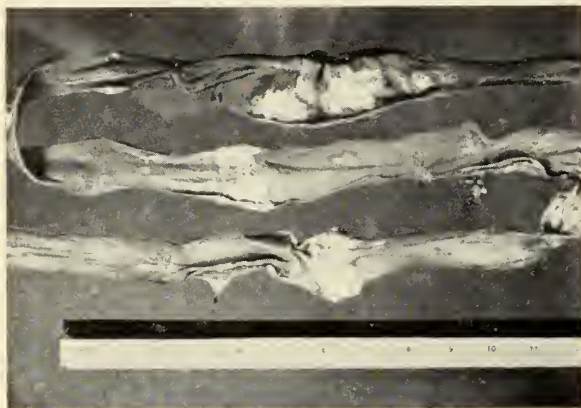


FIG. 2. Thickened plaques in wall of small intestine in congenital syphilis.

may be ulceration and perforation with peritonitis. In some cases, peritonitis occurs without demonstrable perforation. These lesions are usually in the small intestine, especially the last portion of the ileum. Miliary syphilomas and abscess-like foci are also seen.

In acquired syphilis, intestinal lesions are rare but do occur. They are multiple and annular, and may be either punched out, clean, granulating ulcers, or gummas of the wall.<sup>1</sup>

5. *Actinomycosis*. In the abdominal type of actinomycosis, there is extensive fibrosis of the bowel wall usually in the ileocecal region, with numerous abscesses and fistulous tracts leading from the lumen of the intestine.<sup>1</sup> The characteristic "sulfur granules" (colonies of actinomyces) are often present. The associated adhesions, acute inflammatory exudate, and enlarged lymph nodes may lead to intestinal obstruction. In some cases, the diagnosis is established only at the time of operation for a suspected appendicitis. Persistent fistulae are likely to result from such an operation.

6. *Parasites (Helminths)*. There are four important parasitic worms which produce lesions of varying degrees of sever-

ity in the small intestine. These are: Tapeworms, round worms (*ascaris*), hookworms, and *Strongyloides stercoralis*. Both the tapeworm and the round worm produce minimal lesions in the intestine—slight inflammation, petechiae, or minute areas of superficial ulceration. Rarely, in cases of heavy infestation with either round worms or tapeworms, a mass of worms may obstruct the intestine. There is a center of heavy *ascaris* infestation in South Central Louisiana.<sup>9</sup> In autopsies at Charity Hospital in New Orleans, not infrequently one finds large numbers of these worms in the small intestine of children. Improved sanitation and the prevention of fecal contamination of soil will control *ascaris* infestation.

In hookworm disease, the parasites are present in the jejunum and ileum. There are mucosal petechiae and ecchymoses, often with superficial ulceration in the centers.<sup>4</sup> Worms may be found attached to the mucosa. The anemia quite constantly seen in this disease is the result of loss of blood by the action of the parasite in the intestine, nutritional deficiency, and defective absorption of food. The peak age incidence (24.5 per cent) is between 15 and 19 years. Negroes are affected less frequently than whites in the proportion of about 1 to 4.<sup>10</sup>

Of the four worms named above, *Strongyloides* produces the greatest degree of intestinal damage. Most of the worms live in the duodenum and jejunum.<sup>11</sup> The mucosa is swollen, red, and soft. Mechanical and lytic damage results in honeycombing of the depths of the mucosa, sloughing and ulceration. The closeness of contact between host and invading worms in this disease is perhaps reflected by the conspicuous eosinophilia, as high as 40 per cent.

7. *Deficiency diseases*. In pellagra, there is inflammation of variable degree throughout the gastrointestinal tract. In tropical sprue, the wall of the intestine is thin and the mucosa is atrophic, with few glands and inconspicuous lymphoid tissue.<sup>4</sup> In some cases of nontropical sprue, the cause is found to be a small or large tumor blocking the entrance of the pancreatic duct

into the duodenum. The intestinal mucosa is usually atrophic.

8. *Regional enteritis*. Although the terminal ileum is involved in approximately 85 per cent of these cases, the disease may be found anywhere from the jejunum to the sigmoid with "skipped areas" between multiple areas of involvement.<sup>12</sup> Neither the immediate cause nor the primary site of the disease has been established.<sup>13</sup> Reichert and Mathes,<sup>14</sup> Hadfield,<sup>15</sup> Erskine,<sup>16</sup> and Bockus<sup>13</sup> suggest the following pathogenesis. Possibly the primary lesion is in the lymphatic structures or even the mesenteric lymph nodes (a mesenteric lymphadenitis). Involvement of these structures is accompanied by obstruction to lymphatic drainage and edema of the intestinal wall (particularly the submucosa) and the mesentery. The involved segment of bowel, lacking proper drainage, becomes infected possibly by bacteria within the lumen or by organisms reaching the bowel in retrograde flow from infected lymph nodes. Erskine<sup>16</sup> found a variety of organisms (streptococci, colon bacilli, and tubercle bacilli) in lymph node cultures of three of his cases, all showing the same histologic reaction in the bowel wall. This theory of pathogenesis offers a possible explanation for the microscopic picture suggestive of tuberculosis in some cases of regional enteritis since it would be possible for regional enteritis to be initiated in these cases by primary enteric or glandular tuberculosis. The primary tuberculous infection, although overcome, might leave in its wake permanent damage to lymphatics with obstruction to drainage from the intestine, paving the way for the inroads of secondary infecting organisms, other than the tubercle bacilli, which might initiate the lesions of regional enteritis.

Grossly, the involved segment of bowel shows a greatly thickened, heavy, leathery wall with narrowing of the lumen (Fig. 3). The mucosa is thickened and ulcerated. Linear longitudinal folds of edematous mucosa and submucosa with linear ulcers are common. Fistulae may extend from the ulcers into other loops of bowel or into the mesentery. The mesentery is thick, edemat-



FIG. 3. Regional enteritis, involving the terminal ileum. The bowel wall is greatly thickened, the lumen narrowed. The mesentery is thick and its fatty lobulations are prominent.

ous, and indurated. The mesenteric lymph nodes are enlarged. Strikingly, the muscularis is not hypertrophic. Thus, the increased thickness of the wall is due to the edema and fibrosis of the mucosa and submucosa. The pathologic features develop gradually, progressing through the acute, ulcerative, obstructive, and fistulous stages. These stages have their clinical counterparts which are not separate diseases but varied manifestations of the same disease. Fistula in ano is said to occur in 15 per cent of all cases.

9. *Diverticulitis*. Duodenal diverticula are not common clinically. However, by injecting plaster of paris into specimens of the duodenum at autopsy, Ackermann<sup>17</sup> found 14 diverticula in 11 of 50 cases. These lesions are globular, funnel-shaped, or cylindrical protrusions usually from the concave, pancreatic border of the duodenum. They are often congenital anomalies and some may represent abortive attempts to form a supernumerary pancreas. In Ackermann's cases, the diverticula were almost equally distributed in the second, third, and fourth parts of the duodenum. Rarely, these diverticula may become inflamed, gangrenous, or undergo perforation, but usually they have no clinical manifestations.



Aside from Meckel's diverticulum, rare diverticula of the jejunum and ileum occur, particularly in the upper jejunum. In this segment, the longitudinal coat of the muscularis is often missing or thin along the mesenteric border, especially when fat is abundant between the leaves of the mesentery. Also, the vessels penetrating the wall on the mesenteric border are larger in the jejunum than below, causing defects through which diverticula may originate.<sup>18</sup> Increased intraluminal pressure causes herniation of the mucous membrane through the other coats of the wall giving rise to a thin-walled sac, lined by mucous membrane and surrounded by fat covered with peritoneum. Thus, they are false diverticula in contrast to the true congenital diverticula of the duodenum. These lesions may be multiple. They are 2 to 8 cm. in diameter, and of a spherical or mushroom shape. Because of the large, open necks of most of these diverticula, stasis is unlikely and diverticulitis and perforation are rare.

In contrast to these rare acquired diverticula of the small intestine, Meckel's diverticulum is seen in 1 to 4 per cent of all persons. It represents the persistence of a portion of the omphalomesenteric duct. Most commonly, the proximal several centimeters of this duct persist, forming an evagination on the antimesenteric border of the ileum, 2 or 3 feet from the ileocecal valve. The mere existence of this structure is not of clinical significance. In a study of 30 specimens of Meckel's diverticula, however, Aschner and Karelitz<sup>19</sup> found abnormal elements in 13. Gastric mucosa, pancreatic tissue and carcinoids are among these abnormal elements. Associated with heterotopic gastric mucosa, there may be typical peptic ulcers in the adjacent mucosa. These are analogous to duodenal ulcers and probably result from irritation and erosion produced by gastric juice derived from the islands of gastric epithelium. Approximately 50 per cent of such ulcers perforate<sup>19</sup> making imperative the surgical excision of these lesions as soon as they are suspected.

In addition, there may be acute inflammation of Meckel's diverticulum, with swelling, congestion, and suppuration of the structure, in the absence of any heterotopic tissue.

The diverticulum may serve as a starting point for an intussusception of the small intestine. The diverticulum becomes the apex of the intussusceptum.<sup>20</sup>

10. *Ulcers of jejunum.* Primary ulcers of the jejunum have been reported.<sup>21</sup> These are circular and punched out, single or multiple, resembling peptic ulcers of the stomach and duodenum. Most of these terminate in perforation. The site of the lesion may be undetermined until laparotomy is performed.

11. *Lesions associated with vascular occlusion.* In mesenteric vascular occlusion, the infarcted segment of bowel is deep purplish red, soggy, and edematous. The peritoneal surface is glistening. The peritoneal cavity contains transparent, sticky amber or bloody fluid. The mesentery is thick and doughy. The lower jejunum and ileum are the most frequently involved sites. The infarct is usually caused by an arterial embolus (about 60 per cent) or a venous thrombosis (about 40 per cent). In about 25 per cent of the cases, the site of vascular occlusion may not be found.<sup>22</sup> Sudden anemia produced by blockage of any branch of the mesenteric artery sets up so violent a muscle spasm of the affected bowel that the part becomes isolated from the neighboring circulation. Thus the vessels functionally become end arteries and infarction results.

In intussusception, the tension and pressure on the veins of the invaginated segment result in passive congestion and edema of the intussusceptum. This additional swelling further reduces the blood supply, leading to hemorrhagic infarction of the intussusceptum.

The twisting of a coil of intestine about its mesentery in a case of volvulus causes occlusion of blood vessels and infarction of this segment of bowel. Meckel's diverticulum with persistent attachment to the um-

bilicus, may be the center about which the bowel rotates.

#### B. NEOPLASMS

##### 1. *Benign tumors.* (a). *Heterotopias:*

Before considering the true neoplasms of the small intestine, a few comments are in order concerning heterotopic tissues in this organ. These structures may be confused grossly and microscopically with neoplasms. For the most part, they are congenital anomalies. Taylor<sup>23</sup> has found gastric mucosa, submucous gastric glands, and pancreatic tissue in various portions of the small intestine, as well as elsewhere in the alimentary tract. The islands of heterotopic tissue may be superficial or deep to the muscularis mucosa and may give an appearance of invasion suggestive of a neoplastic process particularly if deeply situated.

##### (b). *Benign epithelial tumors.*

Ehrlich and Hunter<sup>24</sup> reported 7 adenomatous polyps in the small intestine in a series of 142 cases of polyps of the alimentary tract. These may be single or multiple, grayish red or pink masses, found most frequently in the duodenum. Cattell and Pyrttek<sup>25</sup> state that these are the most common tumors of the small intestine, though all tumors of the small intestine occur infrequently. It is probable that many of these polyps are secondary to localized areas of inflammation with reactive epithelial hyperplasia. It is not clear whether or not these lesions bear the same relationship to carcinoma as do adenomatous polyps of the large intestine.

##### (c). *Benign mesenchymal tumors.*

The most common tumors of this group, and second in incidence of all tumors of the small intestine, are the leiomyomas.<sup>25, 26</sup> These may be submucosal ("inner") or subserosal ("outer"). The submucosal growths are usually smaller but may cause intestinal obstruction by protruding into the lumen. The subserosal ones are larger and bulge as a rounded mass from the antimesenteric surface of the bowel (Fig. 4). They may undergo focal hemorrhagic necrosis. Merging of these necrotic regions and eventual rupture into the lumen of the bowel may



FIG. 4. Large "outer" (subserosal) leiomyoma of small intestine.

cause massive hemorrhage.<sup>27</sup> Subserosal leiomyomas occur more frequently than the submucosal ones in the ratio of 3 to 2. Fibromas, lipomas, and hemangiomas of the small intestine are reported. Fibromas<sup>26</sup> and hemangiomas<sup>28</sup> may be multiple.

##### (d). *Carcinoids.*

Most pathologists are agreed that carcinoids are derived from the argentaffine cells of Nicolas-Kultschitsky. Porter and Whelan<sup>29</sup> state that carcinoids are found in from 0.2 per cent to 0.5 per cent of appendices removed surgically and that the incidence of these tumors in the small bowel is less than one-half that figure. In the small bowel, carcinoids occur mostly in the terminal ileum. In some cases, they are multiple. They are highly characteristic, bright yellow, nonencapsulated but circumscribed tumors of the submucosa forming a bulge on the mucosal surface. On section, the surface is yellow with white interlacing strands. In the larger ones, extension to the serosa results in adhesions to adjacent structures with kinking and obstruction of the bowel. On the other hand, carcinomas produce intestinal obstruction by an annular constricting growth with narrowing of the lumen. The carcinoids of the small intestine are more likely to show me-



tastases than those in the appendix. This had led to the suggestion that the carcinoids found in obliterated appendices may be the result of proliferation of the argentaffine cells following inflammation, while the tumors of extra-appendiceal origin are true neoplasms.<sup>29</sup>

2. *Malignant tumors.* (a) *Carcinoma.* Nickerson and Williams<sup>30</sup> found that carcinomas of the small intestine make up about 2 percent of all carcinomas of the alimentary tract. Somewhat more than half of these are primary in the duodenum, the remainder occurring in the jejunum and ileum. Grossly, these lesions may be fungating, ulcerating, or infiltrating (annular) (Fig. 5). They



FIG. 5. Annular, constricting carcinoma of small intestine. Note slight dilatation of proximal segment.

are usually adenocarcinomas. Those occurring in the duodenum at the ampulla of Vater may arise from the epithelium of the duodenum itself, the common bile duct, the pancreatic duct, or the ampulla. Usually by the time these carcinomas are examined pathologically they have involved all of these structures,<sup>31</sup> and it is impossible to determine the exact tissue of origin. Because of this fact, Baggenstoss<sup>32</sup> proposes that these should be designated "carcinomas of the major papilla." Invasion of the pancreas and obstruction of the bile and pancreatic ducts are com-

mon complications. Michael and Bell<sup>33</sup> reported a case of adenocarcinoma arising in a Meckel's diverticulum. They found no carcinomas and 7 sarcomas of Meckel's diverticulum previously reported. There is a specimen of carcinoma at the base of a Meckel's diverticulum in our collection. (Fig. 6).



FIG. 6. Carcinoma at base of Meckel's diverticulum.

Sarcomas of the small intestine occur even less frequently than carcinomas. The most important ones are leiomyosarcoma and lymphosarcoma. Leiomyosarcomas are localized masses in the intestinal wall. They may arise in leiomyomas and even when histologically malignant, seldom metastasize. Lymphosarcomas cause diffuse regional infiltration of the intestinal wall with grayish white, friable tissue. At times, they may occur as solitary lesions without involvement of any other tissue in the body and thus present the possibility of cure by surgical excision.

#### SUMMARY

The gross pathologic changes of certain inflammatory lesions and neoplasms of the small bowel have been presented. Included in the inflammatory lesions are: bacillary dysentery, typhoid fever, tuberculosis, syphilis, actinomycosis, parasitic diseases, deficiency diseases, regional enteritis, diverticulitis, and ulcers of the jejunum. A few of the disorders associated with occlusion of the mesenteric vessels are described. Be-

nign and malignant neoplasms are considered. Of these uncommon tumors, adenomatous polyps, leiomyomas, carcinomas, and carcinoids are most often seen.

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## ROENTGENOLOGIC MANIFESTATIONS OF THE SMALL INTESTINE\*

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NEW ORLEANS

Examination of the small intestine, if properly done, is one of the most difficult procedures which confront the radiologist. Nevertheless, it is sufficiently accurate to warrant its use whenever a lesion of the small bowel is suspected. In the Mayo Clinic series, Good found an accuracy of 95.8 per cent in regional enteritis and 35.7 per cent in tumors of the small intestine in cases having adequate roentgenologic examination. It requires frequent fluoroscopic and roentgenographic observations, during which an attempt is made to visualize and separate every segment of the barium filled bowel. Lesions seen are recorded on roentgenograms, sometimes obtained as spot films.

### INDICATIONS

Roentgenologic examination of the small intestine should not be undertaken until it

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has been proved that there is no lesion in the colon, stomach, or duodenum which might account for the patient's symptoms. Some of the most common presenting symptoms may be those of intermittent obstruction, cramping pain, bleeding, anemia, mass, fistulae, and weight loss.

#### METHOD OF EXAMINATION

The most satisfactory method of examination of the small bowel is by oral administration of a water suspension of plain barium sulfate. The addition of a 5 per cent glucose or normal saline solution will hasten the transit time but has no particular advantage in making the examination less difficult. The passage of a double tube into the lower ileum and the administration of opaque media through the tube is another satisfactory method of filling the loops of the small bowel but is quite inconvenient to the patient. Once the tube reaches the ileum, the examination requires only ten to fifteen minutes. If the tube is inserted to the second portion of the duodenum, care must be exercised in administering the barium since too rapid injection may cause vascular collapse. In most cases the examination of the lower ileum may be very satisfactorily accomplished by the barium enema technic.

#### NORMAL APPEARANCE OF SMALL INTESTINE

The small intestine extends from the pylorus to the ileocecal valve and is about 4 meters in length. The diameter decreases from 4 cm. to about 2.5 cm. at the lower end. There are two sections of the small intestine, the duodenum and the mesenteric small intestine, the latter being further subdivided into the jejunum and ileum. The inner aspect shows permanent crescentic folds involving both the mucosa and submucosa and usually extending one-half to two-thirds of the way around the lumen of the bowel. These folds are absent from the first portion of the duodenum but are present in the second portion; they average 5 cm. in length by 3 mm. in the upper small bowel. These folds disappear in the lower ileum. The jejunum occupies the left side of the abdomen; the ileum, the right lower abdomen.

#### DIVERTICULA

Diverticula are found in any portion of the bowel and they may be single or multiple. They occur at the mesenteric side where the blood vessels pierce the muscularis of the bowel. As a rule, diverticula are found accidentally at roentgenologic examination. The mucosal folds are found in the neck but not in the diverticulum itself. Rarely a diverticulum may cause obstruction, perforation or bleeding. Meckel's diverticulum, which is found in 2 per cent of cases coming to autopsy, is seldom diagnosed roentgenographically. According to Keith, various complications may be peptic ulceration as a result of heterotopic gastric mucosa within the diverticulum, obstruction, inflammatory reaction, umbilical fistulae, and neoplasm. Most Meckel's diverticula show no evidence of a pathologic process and consequently produce no symptoms.

#### CASE REPORTS

*Case 1—Diverticula of the Small Intestine.* A 53 year old female came in with a complaint of gas, fullness and a dull aching pain in the right side of the abdomen. Physical examination was essentially negative, and the laboratory findings were negative except that on a G. I. series two diverticula were found. One was in the second portion of the duodenum, the other at the ligament of Treitz. The type of diverticulum seen at the ligament of Treitz in this case is the type that often gives trouble, that is, it has a narrow neck which favors stasis and infection within the diverticulum.

*Case 2—Obstruction due to Diverticulum.* This patient was an elderly female who came in with obstruction. A Miller-Abbott tube was passed to the second portion of the duodenum and some thin barium solution was instilled at this level. An inverted diverticulum was found in the second portion of the duodenum, causing obstruction by intussusception. Several other loops of small intestine were distended. This is another complication of diverticula.

*Case 3—Acute Suppurative Meckel's Diverticulum causing Obstruction of the Small Intestine.* The patient was a 52 year old white female who came in with a typical small bowel obstruction. She had had no bowel movement for three days. During this time her abdomen had become swollen and tender. She had not experienced any attacks like this before. X-ray examination of the abdomen by a flat plate showed distended loops of small bowel and fluid levels. The patient was

treated conservatively with Miller-Abbott tube decompression without success, so surgery was advised. At operation acute suppurative Meckel's diverticulum was found with localization and abscess formation.

TUMORS

The following is a simple classification of the more common neoplasms found in the small intestine.

Malignant	Benign
(a) Carcinoma	Leiomyoma
Scirrhus	Lipoma
Polypoid	Adenoma (incl. polyps)
Mucoid	Fibroma
(b) Sarcoma	Hemangioma
Lympho	Angioma

Tumors of the small bowel are seldom seen and indications are usually secondary, so that specific cytologic diagnosis can rarely be made. The location of both benign and malignant tumors is demonstrated by the following two charts submitted by Weber and Kirklin of the Mayo Clinic.

TABLE I  
MALIGNANT LESIONS OF THE SMALL INTESTINE,  
1907 TO 1939, INCLUSIVE (FROM MAYO)

Lesion	Duodenum	Jejunum	Ileum	Meckel's Diverti- culum	Multiple	Not Specified	Total
Adenocarcinoma	23	31	21		4	1	80
Leiomyosarcoma	2	2	1	4		1	10
Other Lesions		1*	1†				2
No pathologic specimen	4	6	4			2	16
Total	29	40	27	4	4	4	108

\*Epithelioma, multiple, melanotic type  
†Hemangio-endothelioma

TABLE II  
BENIGN LESIONS OF THE SMALL INTESTINE,  
1907 TO 1939, INCLUSIVE

Lesion	Duodenum	Jejunum	Ileum	Multiple	Not Specified	Total
Adenoma	6	2	3			11
Myoma	8	4	2			14
Lipoma		2	2			4
Fibroma	1	1	2			4
Hemangioma	2		1			3
Osteochondroma					1	1
No Specimen		1	1	1	1	4
Total	17	10	11	1	2	41

According to Ewing, about 3 per cent of all gastrointestinal malignant tumors occur in the small intestine. In a series of 228 cases of cancer of the small intestine compiled by Hoffman and Polk, 45.6 per cent occurred in the duodenum and 54.4 per cent in the jejunum and ileum. For both benign and malignant tumors, the most common place of occurrence is the second portion of the duodenum, with the lower end of the ileum ranking second in point of frequency. Adenomas constitute about one-third of all benign tumors, and pancreatic rests are found about as frequently as adenomas. Horsley and Keasbey estimate that 95 per cent of benign tumors of the small intestine are of the intraluminal type.

An important associated factor in tumors of the small intestine is the development of intussusception. The involved loop of bowel may show the following roentgenologic characteristics:

1. Obstruction (small intestinal).
2. A threadlike area of barium making an exit through the lumen of the narrowed intussusception.
3. Stretching of the mucosal folds so that the distance between them appears wider.
4. A translucent area produced by the intussuscepted loop displacing the barium. The essential roentgenologic findings in tumors of the small bowel are as follows:
  1. Evidence of the obstruction with dilatation of the proximal loop.
  2. An annular napkin-ring type of deformity or a translucent area within the lumen, depending upon whether the lesion is scirrhus or adenomatous.
  3. Sarcomas may show an involvement of a diffuse character without obstruction.
  4. Benign tumors may be recognized as an intraluminal, rounded or polypoid area within an otherwise intact small intestine. The submucosal tumors may show localized narrowing of the lumen with intact mucosal folds.
  5. Tumors may produce intussusception and acute obstruction.



## CASE REPORTS

*Case 4—Cicatrizing Hemangioma of the Jejunum.*

A white, single female, aged 50 years came under the observation of a doctor in 1941. At that time a diagnosis of secondary anemia and menopausal syndrome was made. The red blood cell count was 4.2 million (at intervals it was at a lower level) and the hemoglobin was 50 per cent. Between 1941 and 1944 the patient received repeated blood transfusions for secondary anemia. At intervals x-rays of the stomach, small bowel, and colon were done, all of which were negative. In April 1944, the small bowel examination showed a persistent dilatation of the proximal jejunum with an associated partial obstruction. This was demonstrated as an intussuscepting tumor. One month after these findings surgery was advised and a sclerosing hemangioma of the jejunum was resected. The postoperative course was uneventful.

*Case 5—Carcinoma of the Lower Ileum.* This 45 year old single male came to the office with illness dating back four or five months, his chief complaint being soreness and fullness after eating, with some abdominal cramps. The passage of gas or emesis produced relief. X-ray examination consisted of a flat plate of the abdomen, which showed a high grade small intestinal obstruction. There were markedly distended loops of the small intestine and some of the loops measured from 8 to 10 cm. in diameter. The colon was not dilated. Miller-Abbott tube decompression was used, at which time an attempt was made to study the exact level of the obstruction without success. On March 5, 1949, a resection was done and an obstructing carcinoma 2 feet from the ileocecal valve was found with implants on the peritoneal surface of the adjacent small bowel. Microscopic picture of the tissue showed a Grade III adenocarcinoma, Type C Dukes.

## REGIONAL ENTERITIS

Regional enteritis is the most common lesion of the small intestine and is generally found in the terminal ileum, although any portion of the small intestine may be involved. It is usually found in persons between twenty and forty years of age and is more often seen in women than in men. The disease causes cramping, middle abdominal pain often associated with diarrhea, fever and sometimes with a loss of weight. The wall of the intestine is thickened, fibrosed, edematous, with hypertrophy of the muscle, neutrophilic and round cell infiltration, and a small aggregation of lymphocytes which grossly resembles tubercles. A single segment of 2 or 3 inches, or multiple segments

of several feet may be involved. Regional enteritis may be of the hyperplastic or non-sclerosing type.

## CASE REPORTS

*Case 6—Terminal ileitis with Cecal Involvement.*

A 37 year old malnourished white female came in with a chief complaint of loose bowels for one year, with about three to six watery movements daily. There was no blood but mucus was present in the stools. She had intermittent abdominal pain. The blood picture was normal. She was first examined radiographically by small bowel study in 1946 at which time a terminal ileitis was found. The terminal ileum was fixed, the lumen varied from 1 to 5 mm. and the mucosal pattern was abnormal. There was some questionable involvement of the mucosa of the cecum. X-ray of the chest was negative. The patient had lost 13 pounds and at this time she weighed 79 pounds. At surgery the terminal ileum was resected. The right colon was involved and it was resected also. Ileotransversostomy was performed. In 1948 the patient had a total hysterectomy. At this time she was complaining of rectal soreness and of having some diarrhea. In 1949 proctoscopic examination showed changes due to chronic ulcerative colitis. A barium enema was done and the colon was negative above the proctoscopic level except for the ileotransversostomy.

*Case 7—Regional Enteritis with Progression.* A white male of 30 years of age complained of loose bowels for a year or so with progressive loss of weight. His weight at this time was 100 pounds. Several abscesses were drained during the first year of his illness. In 1944, a small bowel examination showed a fixation of the terminal ileum and cecum with a disturbance of the mucosal pattern. An operation was performed with removal of the terminal ileum and cecum, and anastomosis of the remaining ileum to the colon was established. There was a recurrence demonstrated by small bowel study and another operation was performed early in 1945 at which time 62 cm. of ileum and 33 cm. of colon were removed. There was a granulomatous mass at the site of the previous ileocolostomy. The patient had a progressive course downward with numerous abscesses and fistulae. He finally died and autopsy showed regional enteritis involving the remaining jejunum. There were numerous localized peritoneal abscesses.

## TUBERCULOSIS OF THE SMALL INTESTINE

Tuberculosis of the small intestine usually involves the ileum and cecum but may be present in either alone. In one report of 184 cases of tuberculosis with intestinal lesions the small intestine was involved in 6 per cent of the cases, the cecum alone in 19 per cent, and the ileum and cecum in 75 per

cent. A small, short ulcerated area may be present in the ileum which might prove extremely difficult to demonstrate unless pressure films were carefully made at the proper time. The hyperplastic form, which is rare, is characterized by a granulomatous reaction with considerable scar tissue.

#### CASE REPORT

*Case 8—Pulmonary Tuberculosis with Tuberculous Terminal Ileitis and Typhlitis.* Patient was a 33 year old male with bilateral tuberculosis. The sputum was positive and the process involved the greater portion of both upper lobes. He had been complaining of intermittent cramping pain in the right lower quadrant for about eight months, most marked in the afternoon. He had lost 12 pounds of weight in the last month. He was constipated but at the onset of his abdominal complaints he was bothered with loose bowels. He had no blood in the stools. Examination of the small bowel showed a terminal ileitis and an involvement of the distal 6 inches of the ileum. There was also a typhlitis. The terminal ileum showed decreased lumen, fixation, and tenderness, and the mucosa was ulcerated. The cecum was contracted and the mucosa of the cecum was ulcerated. The findings were confirmed by barium enema.

#### INTESTINAL OBSTRUCTION

The examination of the patient with intestinal obstruction should include flat plate of abdomen in the supine and prone positions. It may also be advisable to take an erect or sitting film to demonstrate the layering of fluid in the intestinal tract. In patients too ill for this, lateral recumbent positions may be employed. The roentgenographic diagnosis depends upon two factors: first, the dilatation of the small intestine and, second, the accumulation of fluid and gas. In the erect position one may be able to see fluid levels surmounted by dome-shaped bubbles throughout the distended loops of intestine. The roentgenologist may be able to differentiate between paralytic and mechanical ileus by the gas bubble in the stomach and distention of the colon. Late in the picture the findings are identical in both the mechanical and paralytic ileus. The time generally given as required before a roentgenogram may be expected to be positive in acute intestinal obstruction is one to five hours, the average being three hours.

The Miller-Abbott tube has been useful

in the management of cases of intestinal obstruction, and instillation of a dilute suspension of barium sulfate through the tube may be of value in localizing the actual zone of obstruction. The Miller-Abbott tube should be passed under fluoroscopic control to the second portion of the duodenum.

#### CASE REPORT

*Case 9—Acute Intestinal Obstruction due to Paraduodenal Internal Hernia.* A 52 year old male acutely ill with distention, vomiting and abdominal pain. Symptoms began with a sudden onset of pain the previous night. Clinical manifestations were those of an acute upper intestinal mechanical obstruction. Roentgenographic examination by flat plate of the abdomen showed distended loops of small bowel. No fluid levels were present at this time, probably because upright films were not taken. It was advised that surgery be resorted to and at operation a paraduodenal internal hernia was found.

#### NUTRITIONAL DISTURBANCES

(a) Vitamin deficiency states have been described in the literature by Golden and others. The findings have been listed as changes in mucosal relief pattern and changes in motility. I have been unable to specifically identify vitamin deficiencies.

(b) Thayson concluded that celiac disease or intestinal infantilism of childhood, non-tropical sprue or idiopathic steatorrhea of adults, and tropical sprue were very nearly related or perhaps identical and could be grouped under the term idiopathic steatorrhea.

Mackie, Snell and Camp were among the first observers to point out certain roentgenologic changes frequently seen in this group of disorders. Others have confirmed their findings.

The most striking change is an obliteration of the valvulae conniventes causing a smooth appearance of the margins of the barium filled intestine. Sausage-like masses of barium often remain stationary for a time in the loops of jejunum. This appearance has been noted most often in second and third filled loops. The presense of these smooth, dilated, barium filled, sausage-like segments is designated by Kaston as "moulage sign." After the barium has passed there are often remnants of barium adherent to the mucosa. In other bowel



TABLE III  
THE DIFFERENTIATION BETWEEN CONGENITAL  
PANCREATIC STEATORRHEA AND CELIAC  
DISEASE\*

	Congenital Pancreatic Steatorrhea	Celiac Disease
Time of onset of symptoms.....	Birth	9 mos. to 2 yrs. of age
Gross appearance of stools.....	Oil present (butter stools)	Oil absent
Fat in stools present as.....	Neutral fats	Fatty acids, soaps
Glucose tolerance curve.....	Normal or high	Flat
Autopsy .....	Lesions in pancreas	No pancreatic lesion

\*From Harper, M. H.: Congenital Steatorrhea Due to Pancreatic Defect. Arch. Dis. Childhood, 3:45 (March) 1938.

loops there may be areas showing marked irregularity of the mucosal pattern of the terminal duodenum and jejunum. In idiopathic steatorrhea the markedly irregular Kerkring's folds are not seen as frequently as in the moulage appearance. Hypomotility in the small intestine is the rule, but hypermotility may be present in some of the individual loops intermittently. The changes in small intestine are most marked during acute relapse and have been previously ascribed to avitaminosis B by some, and edema and inflammatory changes by others.

#### CASE REPORT

*Case 10—Sprue (Non-Tropical).* The patient was a 36 year old female who had fatty stools by laboratory analysis. She had been treated for hypochromic anemia with liver, iron, and yeast for the past few years. She had gradually lost weight from 115 to 78 pounds. There was a diffuse osteoporosis on examination of the bony skeleton. The blood calcium was 9.6 and the blood phosphorus was 2.2 mg. per 100 cc. On examination of the small bowel, the margins of the barium filled intestine were smooth and there were dilated loops of small bowel and some hypomotility. There was an ironing out of the normal mucosal folds, especially in the duodenum and upper jejunum.

#### INTESTINAL PARASITES

*Ascaris lumbricoides* produce an elongated filling defect in the lumen of the small intestine which is filled with barium. Barium may be seen in the intestine of the worm for a number of hours.

Hookworm may cause changes in the mucosal pattern of the small intestine. Krause and Crilly described coarsening of the mucosal folds of the mid and lower jejunum in mild cases, and obliteration in severe. Yenikomshian and Shehadi have described

changes in the mucosa of the duodenum which remained for some time after treatment. Hades and Keefer showed 60 per cent abnormal mucosa in 125 proved cases of ankylostomiasis.

#### COMMENT AND SUMMARY

The most common lesions of the small intestine of clinical significance which can be roentgenologically diagnosed are regional enteritis, neoplasms, both malignant and benign, and Meckel's diverticulum. Not infrequently the radiologist will be unable to report the nature of the lesion but may be able to demonstrate an intussusception or obstruction. Regional enteritis has the symptom complex of loose, watery stools, cramping abdominal pain, and loss of weight. The passage of bright red blood or dark blood, or the passage of blood as tarry stools may be the sign or symptom of a tumor. Roentgenologic examination by oral methods should not be attempted in acute obstruction because of danger of impaction of barium and perforation above an obstruction. The introduction of barium through a Miller-Abbott tube in small amounts may be used in certain cases, however. We do not attain the degree of diagnostic accuracy in the roentgenologic examination of the small bowel that we do in the examination of the stomach and colon.

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## INDICATIONS FOR SURGICAL INTERVENTION\*

SAMUEL KARLIN, M. D.

NEW ORLEANS

Obstruction, hemorrhage, and perforation are the usual indications for surgical intervention.

### INTESTINAL OBSTRUCTION

The accompanying table, from Wangenstein, lists the causes of intestinal obstruction. The possibility of intestinal obstruction must be borne in mind in all cases of ill defined abdominal pain, whether intermittent or constant, especially where previous abdominal surgery has been done. The classical picture of obstruction is intermittent peristaltic pain, increasing in frequency and severity, and associated with vomiting. When these signs and symptoms are accompanied by an x-ray of the abdomen showing dilated loops of small bowel, with or without a fluid level, the diagnosis is easy. The presence of bowel sounds or the history of bowel movements does not mean that obstruction is not present. X-rays must be taken with the patient in the prone, upright, and lateral decubitus positions. Dilated loops with fluid levels are diagnostic. One should not wait for distention, vomiting, or peritonitis. Paralytic ileus usually shows uniform distention of both the small and large bowel.

The Miller-Abbott tube is of inestimable value in both the diagnosis and treatment of obstruction. The tube should be passed on all cases, at least into the stomach. A distinction should be made at this time of (1) early, and (2) late, intestinal obstruction. In early obstruction where the patient is admitted free of distention and in electrolyte balance, operation should be performed immediately. In late intestinal obstruction,

TABLE 1  
CAUSES OF INTESTINAL OBSTRUCTION  
WANGENSTEEN

- I. Mechanical Obstruction
  - A) Narrowing of lumen
    1. Stricture of intestinal wall
      - (a) Congenital
      - (b) Acquired
    2. Obturation
      - (a) Gall-stones
      - (b) Ascaris
      - (c) Other foreign bodies
    3. Compression from without
  - B) Intestinal obstruction due to adhesions and bands
  - C) Hernia
    1. External
    2. Internal
  - D) Volvulus
  - E) Intussusception
  - F) Developmental errors
- II. Intestinal obstruction due to nervous imbalance.
  - A) Inhibition (paralytic) ileus
  - B) Spastic or dynamic obstruction
- III. Vascular obstruction.
  - A) Dut to mesenteric thrombosis and embolism

the mortality of immediate surgical intervention is prohibitive. Time must be taken to decompress the abdomen and to permit the restoration of fluid and electrolyte balance. Without previous decompression, the surgeon is faced with the enormous task of trying to locate an obstruction or close the abdomen in the face of greatly distended coils of intestine.

Hendricks and Griffin stressed the two types of intestinal obstruction, high and low. In the high type of obstruction, emesis is profuse, and there is a marked loss of fluid. This type of patient responds well to intravenous fluids, and intestinal decompression with the Miller-Abbott or Levin tube. In the low type of obstruction, vomiting will be late, distention will be more marked, and there will be severe local effects on the obstructed bowel. In their series of cases, low bowel obstruction was located in the terminal ileum in 89.4 per cent of the cases.

It may be well to stress again the features which aid in the diagnosis of intestinal obstruction. The three common complaints are pain, vomiting, and distention.

\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 6, 1949.



The pain is described as colicky, abrupt in onset, and usually located about the umbilicus. There is often complete relief of pain between bouts of colic. The colic is usually synchronous with borborygmus either audible to the patient or apparent on auscultation. Later on, of course, peristalsis may be absent as a result of the distention and paralysis of the bowel.

Severe abdominal pain and shock frequently accompany the onset of a sudden volvulus or internal herniation. Some of these patients are comparatively free of symptoms and signs after the initial severe pain. A flat x-ray taken on admission usually reveals a hairpin or horseshoe type of dilatation, indicative of a closed loop type of obstruction.

Intussusception in adults is usually secondary to tumor or Meckel's diverticulum. However, in children, an etiological factor can be found in only 5 per cent of cases. The diagnosis is suggested by paroxysmal attacks of abdominal pain and vomiting, alternating with intervals free of pain; a mass palpable either abdominally or rectally; bloody stools; and often a characteristic x-ray picture. Barium enema is not only of diagnostic value, but may be used therapeutically to reduce ileocolic intussusception. Ravitch has recently called attention to the older work of Hipsley, of Australia, in the use of the barium enema in the reduction of intussusception. Ravitch reported 27 cases of intussusception treated by barium enema, of which 20 had complete reduction by enema alone. All survived. This mortality is so far superior to that of the surgical treatment of intussusception that it should be tried in all cases although adequate preparation for surgical intervention should be made in case the reduction by barium enema fails. Ravitch called attention to the fact that if the barium enema is given at a height of 3 feet, one can not rupture the bowel nor can one reduce a gangrenous bowel. As for the rate of recurrence, the incidence is 2 per cent both after surgery and after barium enema reduction. Should reduction fail after three rapid attempts by barium enema, the pa-

tient can be taken immediately to the operating room, and reduction performed surgically. If reduction is incomplete or if there is any question as to whether or not reduction has been successful, a small McBurney incision will verify completeness of reduction. The incidence of tumors as a cause of intussusception of the bowel is so small in children that this need not be considered in the treatment.

Rives, Strug, and Essrig, have described two distinct clinical types of mesenteric vascular occlusion: (1) An acute type resulting from sudden blockage of a major mesenteric artery. The history here is that of a patient suffering from severe cardiac disease who suddenly presents the picture of a major abdominal catastrophe: severe abdominal pain, usually cramplike; severe nausea and vomiting; and profound shock. All signs of peristalsis soon disappear. (2) A gradual type due to venous occlusion or a slowly developing arterial thrombosis, which passes from the stage of mild colicky pains thru that of partial intestinal obstruction to that of intestinal strangulation over a period of days. The x-ray shows an ileus of varying grade and the colon contains a normal amount of feces and gas. They stress the following aids in diagnosis: (1) A previous cardiac history; (2) the early disappearance of peristalsis in a case of suspected intestinal obstruction; (3) the constant occurrence of a high white blood count; and (4) the development of shock. Treatment is of course surgical. Intervention should be prompt and radical resection of the bowel is necessary, where gangrene has developed. The mortality in this type of case is obviously very high.

A knowledge of physiology is of utmost importance to the surgeon. Cogswell, in a report of massive resection of the small bowel calls attention to the fact that the amount of bowel removed is of less importance than the amount left behind to carry on absorption and digestion to maintain nutrition. The length of the small bowel may vary from 10 feet to 28 feet, 4 inches, in adults. Haymond reported that resection of 33 per cent of the small bowel could be

done with expectation that the digestive tract would return to normal function, giving 50 per cent as the upper limit of safety. In the case that Cogswell reported, 80 per cent resection was done in a case of superior mesenteric artery thrombosis with survival. In this patient only 14 inches of jejunum were left. Postoperatively, the patient had poor fat digestion with frequent fatty stools, associated with a low cholesterol, and deficient calcium absorption. Carbohydrates and proteins were well metabolized. There was good response postoperatively to a high protein, high carbohydrate, low fat diet, augmented by oral calcium and vitamin D. After resection of the small bowel, compensation takes place by an increase in the diameter of the remaining bowel to almost twice its normal size. There is no increase in the length. West showed that when all but 3 feet of the small bowel were resected in man, carbohydrates were utilized normally, but only 75 per cent of the proteins were used, and but 55 per cent of the fats. When a high fat diet was then given, the patient developed a negative calcium balance manifested by tetany and a low blood calcium. Inadequate compensatory changes following massive resections of the small bowel result in a loss of weight, anemia, diarrhea, tetany, weakness, and possibly vitamin deficiencies.

#### REGIONAL ENTERITIS

A word now of the treatment of regional enteritis. The condition is characterized by cramplike pain, diarrhea, anemia, malnutrition, and draining fistulae. The diagnosis should be suspected in any case with tenderness in the right lower quadrant with or without a palpable mass, fever, or fistulae. The diagnosis of regional enteritis must be considered in all patients with symptoms of acute appendicitis, ulcerative colitis, or intestinal obstruction. In an acute case where the diagnosis has not been established before operation, and where at operation the characteristic findings of a reddened serosa of the bowel with thickening of all the coats, plus a marked thickening of the mesentery with an enlargement of the lymph nodes is found, it is

probably wiser to do nothing. Removal of the appendix at this time may result in a fistula if the cecum is involved, and it is well known that often at a second operation, no trace of the initial lesion has been found. In chronic cases, no surgical intervention is required if the symptoms are mild, if there are no fistulae, and if there is no evidence of intestinal obstruction. According to Crile, operation is indicated only when the symptoms are severe and intractable, or when there is evidence of obstruction or fistulae. Here, side-to-side anastomosis without exclusion of the diseased segment rarely gives a long standing remission of symptoms. However, anastomosis with division of the bowel and exclusion of the involved segment usually results in a remission. This procedure is much safer than resection and certainly as sound from a medical point of view since complete removal of a diseased portion of bowel has not prevented appearance of the disease in other areas. Colp has called attention to the value of doing an ileo-transverse colostomy with exclusion because then, if extension or recurrence takes place proximally, the diseased bowel can be excluded by a second ileal division about 60 cm. proximal to the last physical evidence of disease, provided that sufficient small intestine remains for adequate nutrition. In his opinion, the objections to primary enterocolostomy with exclusion are not valid, since he has never seen a case where the distal divided ileum has blown out because of obstruction in the diseased bowel. Here again, he calls attention to the value of the Miller-Abbott tube, not only for its value in decompressing the small bowel, but because the position of the tip of the tube is of great value in differentiating the distal from the proximal bowel in a mass of matted and strictured bowel.

#### TUBERCULOSIS

Tuberculosis of the small bowel may be dismissed with a short comment. Ralph Adams has stated that "as a matter of principle, operation for intestinal tuberculosis should not be undertaken when there is an active pulmonary infection, except when mandatory because of obstruction, internal



perforation, or likelihood of carcinoma." Resection should not be done unless the diagnosis of malignancy cannot be excluded, and the operation of choice is an ileocolostomy with division and exclusion of the ileum.

#### TUMORS

The symptoms of mild abdominal cramps and intermittent rectal bleeding should arouse suspicion of the possibility of a tumor in the small intestine. Cattell and Colcock divided these tumors into two groups: (1) The largest, and the one which included most of the benign tumors, is one in which the direction of the growth was toward the lumen. Here, the symptoms of obstruction appeared fairly early. (2) In the smaller of the two groups, but unfortunately, the one which contained most of the malignant tumors, the direction of growth was away from the lumen. In these, diagnosis was not made until late because symptoms of obstruction and bleeding appeared much later. McDougal gave a five year overall survival rate of 5 per cent for tumors of the small bowel. Crile gave the occurrence of malignant tumors of the small intestine as 3 per cent of malignant tumors of the gastrointestinal tract. The surgical treatment of these tumors is quite obvious,—resection of the tumor with the involved mesentery. The uniform prognosis is poor except in carcinoid of the ileum. Stewart recently called attention to a new use of the Miller-Abbott tube in the diagnosis of tumors of the small intestine. He had a patient who had had two previous severe hemorrhages and in whom x-ray examination and exploratory laparotomy failed to reveal the lesion. A Miller-Abbott tube was passed into the stomach and, under fluoroscopic control, passed into the duodenum, and then allowed to advance 6 inches every hour. At the end of every hour, a sample of the intestinal contents was taken. When dark blood was obtained, an x-ray was taken; and operation was performed using the position of the Miller-Abbott tube to indicate the tumor of the jejunum which was found to be a leiomyoma. He calls attention to the fact that this procedure is not

free of danger, and that blood must be available in case of an untoward hemorrhage.

#### LESIONS OF THE SMALL BOWEL IN CHILDREN

No discussion of surgery of the small bowel can be considered complete without some mention of the special problem which children present. The accompanying table lists some of the conditions which should be looked for. Embryologically, the events

TABLE 2  
PEDIATRIC PROBLEMS

1. Congenital Atresias and Stenoses
2. Malrotations
  - A. Association with Volvulus of Small Bowel
3. Meckel's Diverticulum
4. Duplications of Alimentary Tract
5. Meconium Ileus—Celiac Disease

which take place between the fifth and tenth weeks of fetal life are responsible for the cases of congenital atresia and stenosis of the intestine. Prior to the fifth week, the intestine presents a well defined lumen lined with epithelium. After this, the epithelium proliferates and the lumen from the pylorus to the ileocecal valve is obliterated. Subsequently vacuoles appear among epithelial cells, and by the twelfth week, the lumen is reformed. Persistence of the septum gives atresia. A partially perforated septum causes stenosis. Similarly, arrest in development during the tenth or eleventh week of fetal life may result in: (1) An incompletely rotated cecum, and (2) a lack of attachment of the mesentery along the posterior abdominal wall. When incomplete rotation of the cecum occurs, the cecum is found just below the distal half of the stomach with bands of reflected peritoneum running from it to the right posterolateral part of the abdominal wall. These bands lie across the descending portion of the duodenum, or the cecum itself may lie over the duodenum causing obstruction. In these cases the mesentery of the small bowel lacks normal fixation, so that it has only a short rudimentary attachment just below the origin of the superior mesenteric artery. Because of this, a volvulus to 360° or more in a clockwise direction may result. Symptoms from these cases occur in half the patients

during the first three weeks of life; and in the other half, may appear at a much later age. From the surgical point of view, it is not enough to relieve the volvulus of the small bowel, but the band obstructing the duodenum must be found and cut or else surgery will be incomplete.

Donovan, in an article on "Gross Intestinal Hemorrhage in Children," lists the following causes of hemorrhage in the order of their importance:

1. Meckel's diverticulum, containing gastric mucosa with ulceration.
2. Duplication of the small intestine, which frequently contains gastric mucous membrane with ulceration, and which is most common in the terminal ileum.
3. Polyp of colon.
4. Duodenal ulcer.

Meckel's diverticulum which represents a portion of the vitelline duct which has opened into the ileum 18 inches to 3 feet above the ileocecal valve may call for surgical intervention because of anyone of the following complications:

1. Hemorrhage.
2. It may be the leading point of an intussusception.
3. It may become inflamed.
4. It may cause obstruction.
5. There may be volvulus and infarction of the diverticulum.

Duplications of the alimentary tract may give rise to symptoms from dilatation which causes obstruction, or from pain caused by distention of the duplication. Again, from a surgical point of view, it is important to remember that the blood supply to the associated normal bowel is intimately bound up with that of the duplication, and it is dangerous to attempt to remove the duplication alone. The entire portion of bowel must be resected.

Ascariasis is not an uncommon cause of intestinal obstruction in children. About one year ago, we saw 4 members of the same family, ages, 1, 2, 3, and 4, all acutely obstructed from round worms. The 3 year old patient was in shock on admission, and died within five minutes. The other 3 recovered after surgical intervention consist-

ing of enterotomy in 2 cases, and resection of a gangrenous loop, which had been twisted through 360°, in the one year old patient, with subsequent end-to-end anastomosis. In the 2 year old patient, the ileum in its lower third was packed with ascaris, and 129 adult worms making up a mass of 3/4 of a liter were removed at operation.

Until the paper of Hiatt and Wilson, in 1948, no case of meconium ileus had recovered. They report 8 cases with 5 recoveries. In 5 of the 8 cases, there was associated volvulus. They believe with Farber that changes in the pancreas are primary and that lack of trypsin results in an abnormal type of meconium which is so sticky that the bowel can not propel it, resulting in intestinal obstruction. One often gets a familial history since this is apt to have occurred in other members of the same family; a story of failure to pass meconium, vomiting of green material, distention, and an empty rectum. Lipiodol used as an enema is of aid in establishing the diagnosis. Treatment consists of a very short period of hydration and intubation followed by early surgical intervention. Proper surgery consists of choosing an enterotomy site just proximal to the atrophic terminal segment of ileum which is filled with meconium concretions. A catheter is inserted and saline injected under tension to permit a flushing out of the concretions. Any devitalized gut must be resected. Volvulus is a frequent complication. Postoperative care consists of a low fat, high protein diet, along with oral pancreatin daily. Neuhauser offered as an additional aid to diagnosis of this condition the finding of small gas bubbles in a medium of water density distal to the main column of gas in the small gut.

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SURGICAL TREATMENT OF PEPTIC  
ULCER, INCLUDING GASTRECTOMY  
AND VAGUS NERVE SECTION

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Within the present decade, medical scientific advance has been exceptionally rapid. The work on many new or revived procedures by our great university medical centers places these procedures at our disposal within a much shorter time than heretofore. The fact that divergence of opinion as to the merits of the experimental work or clinical results exists, is a healthy state, and will continue as long as we make progress. There comes a time, however, when the clinician in outlying echelons must determine for himself, by application, the value of advanced methods. In so doing, he can better judge for himself in those instances where divergent opinions exist.

At this time, therefore, I would like to discuss briefly my limited experience with one of the current recommended surgical procedures for the treatment for peptic ulcer. The number of articles reviewed is not large, but they have been chosen with a conscientious desire to present the subject fairly. The question of choice of proper surgical procedure for gastric ulcer will not be discussed since there seems to be a unanimity of opinion that when the condition of the patient permits, gastric resection should be done. This, of course, is due to the fact that a fairly high percentage of ulcers either are, or become malignant.

For the purpose of comparative study, I have outlined four tables:

Table No. I. Shows the result of treat-

ment of duodenal ulcer by gastroenterostomy alone.

Table No. II. Shows the result of treatment of duodenal ulcer by subtotal gastrectomy.

Table No. III. Shows vagotomy alone.

Table No. IV. Shows treatment by gastroenterostomy with vagotomy.

TABLE I  
GASTROENTEROSTOMY

Author	No. Cases	% Mort.	% Well	% Recur. or Pers.
1. Gardner	68	7.3	88.8	5.6
2. Cooper	279	3.2	83.7	16.3

TABLE II  
GASTRIC RESECTION

Author	No. Cases	% Mort.	% Well	% Recur. or Pers.
1. Gardner	123	8.9	84	5.0
4. Bartels	221	4.5	86.4	1.8
5. St. John	184			
	(-45)	1.0		
	210			
	(-45)	7.6	85	2.5
8. Snelling	*8	0	100	0
		*12	88	

TABLE III  
VAGOTOMY

Author	No. Cases	% Mort.	% Well	% Recur. or Pers.
1. Gardner	77	1.3	80.5	2.6
2. Colp	20	0	*40	15.0
6. Dragstedt	96	.2	93.5	3.0
7. Sanders	*50	0	94	6
8. Snelling	9	0	100	0
9. Cole	15	0	93.4	6.6

TABLE IV  
VAGOTOMY WITH GASTROENTEROSTOMY

Author	No. Cases	% Mort.	% Well	% Recur. or Pers.
2. Colp	26	3.8	65	7.6
6. Dragstedt	64	0	100	0
8. Snelling	5	0	100	0
9. Cole	60	1.6	98.4	0

There are other pertinent facts, which are not noted in the statistical study in the tables just given, such as (1) nonfatal postoperative complications, (2) reoperation for continued distention, (3) complications based on surgical approach, (4) late disabling symptoms, (5) late secondary effects, and many others. Briefly, let us consider some of these.

In gastrectomy, we encounter a comparatively large number of nonfatal, postopera-

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tive complications such as those noted by St. John.<sup>5</sup> Some of those more frequently occurring are as follows: (1) pneumonia, (2) excessive vomiting, (3) spasm or obstruction of efferent or afferent loop, (4) biliary fistula, (5) diarrhea, (6) gastrointestinal hemorrhage, and (7) wound infection. Any of these or other complications may occur in any of the other procedures under discussion, but the comparative technical ease of their accomplishment in itself tends to lessen the incidence.

In a recent meticulous study of twenty patients who had undergone gastrectomy, Aldesberg and Hammerschlag have classified postgastrectomy syndrome into "early" and "late" postprandial symptoms. The early symptoms were: (1) epigastric pressure, (2) nausea and fullness, (3) eructation and belching, (4) dizziness, and (5) occasional vomiting. These symptoms could be observed during eating, immediately after the meal, or after a short interval. The late symptoms occurring usually in the second or third hour after meals were: (1) headache, (2) fatigue, (3) weakness, (4) perspiration, (5) palpitation, (6) dizziness, (7) shortness of breath, and (8) occasional precordial pressure.

The early symptoms are attributed to mechanical factors: distention and rapid emptying of the stomach (small), and overflowing of the small intestine. Gastritis of the stump as well as jejunitis may be predisposing factors. The late symptoms are attributed to chemical factors: hypoglycemia secondary to the exaggerated postprandial hyperglycemia. There is, of course, the possibility of increased sensitivity to insulin.

A number of surgeons<sup>12, 13</sup> recently have called attention to the fact that the mechanical factors controlling the early symptoms of the postgastrectomy state can be modified with benefit by using the Hopmeister-Finsterer technic.

At present, however, while it is a well accepted fact that the mortality rate for gastric resection is low, that marginal ulcers occur very infrequently, and that the Hopmeister-Finsterer type of operation

will probably modify untoward symptoms of the postgastrectomy state, there still remain, according to varying statistics, anywhere from 6 to 38 per cent of patients who have had gastrectomy, who have unfavorable sequelae.

Nonfatal postoperative complications of vagotomy alone or vagotomy with gastroenterostomy are few.<sup>1, 2, 6, 7, 9</sup>

We are all impressed, I am sure, with the fact that the mortality rate for subtotal gastric resection is constantly being lowered, and there is no doubt that with the proper choice and handling, all of us may approach the accomplishment of the record shown in two series of cases recently reported by Bartels<sup>4</sup> and Gavisser<sup>10</sup>.

In these reports, as many others, however, it is noted that the mortality rate is distinctly higher in the older age group, particularly in those 45 to 50 and over.

#### CASE REPORT

One case in my series is worthy of special comment:

P. Q. R., a white male, age 72. Preoperative study showed an obstructive lesion at the pylorus or first part of the duodenum. Nutrition by mouth was unsatisfactory, but by parenteral means, blood, glucose and amino acids were given so that the condition of the patient seemed satisfactory for surgery. On opening the abdomen and inspecting the area involved, it was not possible, because of the great amount of old inflammatory reaction at the pyloric end of the stomach, and the duodenum with the distorted anatomy of the surrounding structures, to tell whether the ulcer was situated on the stomach or duodenal side. In an effort to clearly ascertain this point, injury to the gastric vein occurred, and in controlling the hemorrhage, the portal structures were injured.

I am clearly of the opinion, that we should have relied on x-ray findings together with the apparent gross pathology, and should have done either a posterior gastroenterostomy with vagotomy, or partial gastrectomy with secondary removal of the pyloric antrum.

#### SUMMARY

1. The ideal single surgical procedure for the cure of duodenal ulcer has not yet been clearly demonstrated.

2. Subtotal gastrectomy is an excellent procedure, but is not always adaptable to the older age group.



3. Gastroenterostomy alone is not a procedure of choice.

4. Vagotomy with posterior gastroenterostomy appears to have a definite value in a limited number of cases.

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#### DISCUSSION

Dr. Donovan Browne (New Orleans): We have been privileged to hear one of the best prepared and executed symposiums on the small bowel that I have ever heard. You have heard it said that an institution is as strong as its pathological department; I think that might be extended to the individual, too.

I can't help but extend special congratulations to Dr. Bill Harris for giving us the news behind the news in administering a degree of spectacularness to his presentation.

Dr. Weinberger commented on and called our attention to the psychoneurotic who comes to us with a deficient state. This might well be stressed because it is most disconcerting to find your psychoneurotic patient on the autopsy table. These patients may be psychoneurotic, but they are subject to disease also and by the time they get to you and me, probably they have developed some such state as Dr. Weinberger has mentioned. It becomes not a problem principally for the psychiatrist, but evolves itself into a problem of careful cooperation between the neuropsychiatrist and

the internist because you are dealing then not only with the neurosis or psychoneurosis but with the combination, and the treatment of one is not complete without proper attention to the other. The nutritional states must be attended to and the psychiatrist must follow through with rehabilitation and correction, if possible, of the fundamental disturbances.

Dr. Watt made one comment I was very much interested in that amebiasis may exist without symptoms. It is true that this infection is rather widespread and comparatively 14 per cent of the population is infected; but it is interesting to note in the carefully followed up group in a gastro-intestinal survey that 38 to 40 per cent of the patients with this infection had no symptomatology, and there is a tendency when this infection is found to make all things revolve around it, and every complaint the individual has is accounted for on that basis.

I think we should be very careful of that, and there's a word of caution in that these very few completed cases constitute only about 2 per cent of the patients. They make the headlines and a campaign of fear and fright is instituted.

A few years ago agglutinations were used as a criterion to find if there was an infection. We know now that's not true and we know there are a great number of patients carrying this infection. We are not dealing always with the infection you find in the bowel as an ideological factor for the symptoms the patient presents, and to get off on a tangent, I think that deserves a little caution as we go along.

Finally, Dr. Snelling. I want to make one comment. I don't think I know all the anatomy, and I am quite sure I don't know the physiology involved in vagotomy and yet we are in a nebulous state with this procedure. That it's not the answer to the peptic ulcer problem has been freely admitted. Probably by such careful studies and following up as you have seen here, we may arrive at a decent criterion for its application at the present time. We have declared a moratorium on it.

It's interesting, here, that results with gastric resection are equally as good as those with vagotomy and a combination of vagotomy and enterostomy. I am sorry we haven't had as good results as have been rendered here. There are complications and distention of the abdomen and disturbances in the lower gut. You are familiar with these from the literature, and I would give a word of caution in the adoption of this procedure by the surgeon. It should be as you have seen presented here, a careful selection of cases made and a proper follow-up, and probably that would help us to find a little better occasion for using it.

For example, I understand that someone said vagotomy is not advocated in gastric ulcers because of the possibility of malignancy and a number of his cases have come back with a malignant

ulcer or which maybe was malignant in the beginning. I don't think vagotomy as presented up to the present time is a substitute or does away with a properly done gastric resection.

Dr. Joe E. Heard (Shreveport): Having been at this game for a long time, I have had the opportunity to watch the development of gastric surgery. In the first place, we should distinguish between gastric ulcer and duodenal ulcer. As far as I am concerned, we have little to offer the gastric ulcer, except gastric resection. I have seen these cases get into trouble elsewhere, because resection was not done and they later turned up with gastric cancer. In the old days gastroenterostomy was the method of choice for gastric and duodenal ulcers. American surgeons were quick to accept gastric resection for gastric ulcers and later included the same procedure for the duodenal ulcer. We still use gastroenterostomy in certain selected cases, although this procedure is more or less obsolete. The old patient with a duodenal obstruction, a poor surgical risk, and a low acidity, is still a good one for gastroenterostomy. Now, that vagotomy has been developed, it would seem to me that such a procedure, combined with gastroenterostomy, is still worth serious consideration in the older patients who are poor surgical risks. One trouble with the present status of vagotomy is that it has not been in use long enough and not enough cases have been done to properly evaluate it. I feel that this procedure may be well worthwhile on the selected case.

A gastric ulcer to me nearly always means gastric resection. Even with the ulcer in the surgeon's hands, it is impossible to tell at times whether it is malignant or benign. It has been definitely shown that gastric ulcers have been cured clinically and radiologically and later a cancer would develop at the same site. Had this ulcer been resected when first discovered, it is almost sure that this case would have been a cure.

In the procedure of gastrectomy, and I mean here when using the term partial, we use the Hoffmeister technic. The results have been excellent. Vagotomy alone for ulcer, from what I have seen of it and what many prominent surgeons feel about it, is not the procedure of choice. It should be combined with gastroenterostomy. It is a rather simple procedure to clip the vagus nerve from the abdominal side. This, combined with gastroenterostomy in old people with a low acidity, is a procedure worth considering. The mortality in this group is definitely higher for partial gastrectomy, whereas with vagotomy, and gastroenterostomy the mortality is practically nil. As we all know, there has been a wave of hysteria over nerve cutting operations, and it has been carried to the extreme. A moratorium which was suggested by one of our leading surgeons, is certainly the proper thing. I enjoyed Dr. Snelling's presentation and feel that this procedure, combined with gastro-

enterostomy is worthwhile in carefully selected patients, and gives more time to study the results and more cases better to evaluate this procedure.

Dr. J. G. Snelling (Monroe): I would like to have a minute to bring out one point in my paper. I stated very clearly that I am in accord with Dr. Heard and the rest of the discussants that gastrectomy is the procedure of choice for gastric ulcers. I really feel that vagotomy with gastroenterostomy will prevent the stagnation and generation of organic acids which produce the diarrhea and uncomfortable symptoms. If the procedures are combined, it will be a procedure which one could consider and use particularly in the old age group.

Definitely, I don't feel that it's a panacea or utopia.

Dr. Murrel H. Kaplan (New Orleans): The only question that comes to my mind in the case of vagotomy as we have seen a bit of it in New Orleans, is the question whether the disease is worse than the cure. In other words, you tell us you have a hundred per cent cure as far as the ulcer is concerned. We would like to know what percentage of your patients have untoward symptoms and the duration of these?

Dr. Snelling (In Conclusion): I stated that my experience has been limited. I don't think a man could speak with authority on the basis of 15 or 20 cases. I did show the review of literature of some excellent men, and I reviewed those series very carefully and the figures are shown. Actually there are untoward symptoms that follow gastrectomy. There are the early symptoms and the late symptoms. I think you gastroenterologists know that. They aren't completely comfortable. If you review the subject it will run from 6 to 38 per cent and they are just as uncomfortable as those having untoward symptoms following vagotomy. I couldn't speak with authority on that number of cases. If the procedure is combined and properly done the untoward symptoms will be minimum and no greater than they are with gastrectomy. If you have a procedure which entails quite a bit more of surgery, particularly when you try to apply it to the old age group, you might well consider the choice of an alternative procedure.

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## ABDOMINAL EMERGENCIES IN INFANCY AND CHILDHOOD

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This paper on abdominal emergencies is intended to portray only the informative and troublesome cases which I have seen in

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private practice in the three years since my discharge from the service. It does not include abdominal trauma, tumors, or poisoning.

In our approach to the diagnosis of abdominal emergencies only a few of the many diagnostic leads available will be considered. They are: first, abdominal pain, tenderness and rigidity associated with infections; second, hemorrhage; and third, obstruction.

#### ABDOMINAL PAIN

When the presenting complaint is abdominal pain, an attempt is first made to exclude all extra-abdominal causes then to approach the abdomen last.

#### EXTRA-ABDOMINAL CAUSES

Common causes have been upper respiratory infection, pneumonia, pleurisy, pyuria, acidosis, and allergic states. Less common causes have been gastroenteritis associated with measles, crystalluria, and central nervous system disease, especially poliomyelitis.

The severe colicky pain of crystalluria closely resembles that of intussusception. There is also an absence of tenderness and rigidity. While not all are of an emergency nature, two instances occurred which required immediate intervention by a urologist.

The abdominal pain associated with poliomyelitis should be mentioned because 5 children with this disease were seen this past year; each because of abdominal pain as the presenting symptom. Two were physicians' children. Since all had an inflamed throat and 1 a pneumonia, in addition, I can only speculate as to whether the pain was caused by the respiratory infection or by the poliomyelitis. This is pointed out to stress the value of excluding extra-abdominal causes of pain before the abdomen is approached.

#### INTRA-ABDOMINAL CAUSES

As we approach the abdomen the predominant thought is, "Is this a surgical emergency?" and infection and obstruction come to the front. But another condition which must be differentiated from infection, especially from appendicitis, is the ab-

dominal pain and tenderness of mesenteric adenitis accompanying an upper respiratory infection. It is this latter condition which causes more difficulty in diagnosis than anything else in my practice. After years of trying to formulate a satisfactory differential diagnosis between mesenteric adenitis (so-called tonsillitis of the abdomen) and appendicitis, I find the subject just as cloudy whenever the problem presents itself. If pain and tenderness are present in the other quadrants of the abdomen the problem is simple; if, however, the pain and tenderness are localized in the right lower quadrant, which is so commonly the case, I find it very comforting to share the responsibility with a surgeon. Since vomiting, pain, tenderness, voluntary rigidity, fever, and leukocytosis, as well as an inflamed throat are often present in both conditions, we usually observe the patient for a day; remembering, of course, that appendicitis may also be a complication of an upper respiratory infection. When a reasonable doubt exists we feel it safer to explore.

Another condition with pain and tenderness in the right lower quadrant is acute catarrhal jaundice, which in the absence of an epidemic, is easily missed if the patient is seen under artificial lights and one fails to ask the color of the stools and urine.

Inflammatory lesions of Meckel's diverticulum simulate appendicitis so closely that a differentiation is seldom possible. Periumbilical pain, nausea, vomiting, fever, and leukocytosis are common to both. However, in diverticulitis there is usually no shifting of pain or maximal tenderness to the right lower quadrant as in appendicitis. Since the treatment is the same it little matters whether the proper diagnosis is made preoperatively. What is important, however, is that a Meckel's diverticulitis should be searched for if the appendix cannot be incriminated at operation. One such case occurred at our hospital last year, though I did not see the patient.

The pain of acute general peritonitis is constant, severe, and accompanied usually by a boardlike involuntary rigidity.

The pain of intussusception, the most common cause of acquired obstruction in infancy and childhood, is sudden, sharp, severe, and recurring, accompanied by vomiting and shock, early. Tenderness and rigidity are usually not present in the first forty-eight hours, but do occur when peritonitis begins.

#### HEMORRHAGE

Hemorrhage from the gastrointestinal tract which has constituted an emergency has been from intussusception, hemorrhagic disease of the new-born, Banti's disease with bleeding esophageal varices, and ulceration of Meckel's diverticulum with marked hemorrhage from the bowel. The latter two instances are briefly described:

L. C., an eight year old white female, was seen for the first time practically exsanguinated. Blood transfusions and the removal of a huge spleen were life-saving measures. For the following six months there was marked improvement, when again severe hemorrhage required repeated blood transfusions. She is now receiving injections of the esophageal varices and her condition has improved.

B. J., an eleven year old white male, developed colicky abdominal pain without nausea or vomiting. Numerous bloody mucus stools had occurred in the twelve hours since the onset. Physical examination was essentially negative except for a vague tenderness about the umbilicus. The outstanding sign was the large amount of blood, clotted and unclotted, which literally poured from the rectum. It was felt we were confronted with a bleeding Meckel's diverticulum rather than an intussusception in view of the lack of shock, vomiting or abdominal mass. At operation, a bleeding Meckel's diverticulum was resected with uneventful recovery.

Hemorrhage from a diverticulum arises from a small peptic ulcer at the neck of the diverticulum or in the adjoining intestine due to the action of acid and pepsin secreted from aberrant gastric mucosa lining the diverticulum.

#### OBSTRUCTIONS

*Pyloric Obstruction:* Three cases of congenital hypertrophic pyloric stenosis were seen. One which presented unusual diagnostic difficulties was:

E. W., a one month old male, referred to me for possible intestinal obstruction because of repeated vomiting, constipation, and fever. The temperature was 103.6° F. The neck and back were very rigid, the reflexes hyperactive, the eyes widely dilated, the abdomen greatly distended with peristaltic sounds absent. A lumbar puncture re-

vealed normal fluid. Then it was learned that one drop of 1 per cent atropine had been given prior to each feeding for the past two days. After combating the abdominal distention, peristaltic waves and projectile vomiting were observed and a pyloric tumor easily palpated.

#### INTESTINAL OBSTRUCTION

*A. Acquired:* With the exception of an incarcerated inguinal hernia in a four and one-half month old infant, intussusception was the only type of acute obstruction observed. We are all familiar with the sudden stormy onset with severe intermittent colicky pain, shock, and vomiting; the palpation of a sausage-shaped tumor and the passage of bloody mucus from the bowel.

The 3 cases of intussusception observed were informative from several angles: All were males; the ages five, eight and ten years. This is in contrast to the usual quoted incidence that 80 per cent occur in the first two years of life. A Meckel's diverticulum served as the initiating point of the intussusception in 2 instances. Six similar complications of Meckel's diverticulum, 1 being a case of Dr. Socola's, were reported during my happy days here in New Orleans some years ago.<sup>1</sup>

That one cannot rely on any single sign in the diagnosis of intussusception, such as bloody mucus from the rectum, or a palpable mass, is well illustrated in the ten year old boy. No bloody mucus was passed during a forty-eight hour period of observation and even the chemical test for blood was negative on mucus obtained from the rectum. In addition, a mass was never palpated.

*B. Congenital:* Congenital obstruction of the bowel is relatively rare but important. About a third of the lesions are found in the duodenum at or near the ampulla of Vater, next at the duodenojejunal junction, and after that the location of the vitteline duct. After a general consideration, we shall discuss the differential diagnosis of duodenal obstruction, then present a case report of congenital duodenal atresia successfully treated by duodenojejunostomy.

The causes of congenital obstruction may be due to a defect in the normal development of the lumen, such as failure of



canalization, or to persistence of the anal membrane, or to meconium ileus; or the obstruction may be due to some extrinsic factor such as pressure produced by tumors, hernias, peritoneal bands, and congenital volvulus. The lumen may be partially or totally occluded.

#### DUODENAL OBSTRUCTION

When the obstruction is in the duodenum, vomiting is the most prominent symptom and begins at once and is persistent. The vomitus contains bile if the obstruction is below the ampulla of Vater—the usual condition. In addition to the rapid loss of weight, dehydration and constipation, abdominal distention and visible peristaltic waves are often present.

Conditions other than pressure by tumors, hernias, peritoneal bands, and congenital volvulus to be excluded are tracheoesophageal fistula, pyloric obstruction, meconium ileus, and imperforate anus.

In tracheoesophageal fistula—the usual type—vomiting, choking, and cyanosis occur immediately after swallowing. Other signs are a constant drooling from the dependent corner of the mouth and a fullness of the epigastrium in contrast to a sunken appearance of the lower abdomen. I mention this latter sign because the case of duodenal atresia presented below also had the fullness in the epigastrium with a sunken appearance of the lower abdomen.

Pyloric obstruction, whether stenosis or spasm, usually does not show symptoms before the tenth day of life nor does the vomitus contain bile.

Meconium ileus, an obstruction due to the dried putty-like meconium, should be suspected in the vomiting infant who has failed to pass a stool.

Imperforate anus is easily excluded by the early distention, late vomiting, absence of stools and, of course, a rectal examination (a).

#### CASE REPORT

A fullterm Latin-American female, weighing 7 pounds, five ounces, was seen on consultation at the local Air Base Hospital on the third day of life because of repeated projectile vomiting of bile-stained material since birth. A meconium stool had been passed on the first and second days of

life. Physical examination revealed upper abdominal distention with a sunken appearance of the lower abdomen. Peristaltic sounds were absent. Rectal examination was negative. Clinical impression was atresia of the duodenum distal to the ampulla of Vater.

While preparing the patient for surgery the following tests were done:

1. A flat plate of the abdomen was taken which revealed air in the stomach and a portion of the duodenum. A small amount of air in the descending colon was considered to have been introduced by the examining finger or rectal tube.

2. Umbrathor\*, an aqueous solution of thorium dioxide, was mixed with equal parts of water and 10 cc. of the mixture introduced through an inlying stomach tube. X-rays then confirmed the clinical impression of duodenal atresia. This radio-opaque material is without danger and, we believe, is superior to barium. It may, if desired, be aspirated easily and completely at the termination of the x-ray studies and does not have the added possible danger associated with the use of barium of subsequently obstructing the intestinal tract.

3. Farber's test for the presence of keratinized epithelial cells in the meconium was not helpful in establishing the diagnosis. In atresia, keratinized epithelial cells are said not to be present. The only specimen of meconium available for study was obtained by digital means with the result that the cells present were in all probability introduced from the skin about the anal area. If reliance is to be placed on this test, obviously great care must be exercised in obtaining the stool specimen and the smear obtained from the center of the stool where no contact with the skin surfaces has occurred.

4. Tests for bile in the meconium were negative.

At operation by Dr. Gordon F. Madding of our clinic, the stomach and duodenum were markedly dilated and the dilatation ended sharply at the lower end of the descending or second portion of the duodenum below the entrance of the common bile duct. The intestine at that point was represented by a cordlike structure approximately one-half inch long. The small and large intestines were collapsed and in malposition. The cecum was incompletely rotated and rested in the upper portion of the abdomen in the midline. A side-to-side duodenojejunostomy was carried out.

Following surgery, the stomach was aspirated frequently and hydration maintained by parenteral Dextrose-Amigen-Ringers solution\*\*. On the third postoperative day dextrose water was given by mouth and the next day, liquid S. M. A. Postoperative x-rays, using umbrathor, revealed no duodenal obstruction or delayed emptying of the stomach. The baby was discharged on the tenth postoperative day, having regained her birth weight. Monthly checks since then have revealed normal growth and development.

## COMMENT

In conclusion, I have attempted to bring together the diagnostic problems concerning abdominal emergencies that have confronted me in private practice with the hope that the result has been practical.

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- \*Manufactured by Heyden Corp., New York, N. Y.
- \*\*Mead Johnson Co.

## CONSERVATIVE MANAGEMENT OF CHRONIC CERVICITIS

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Chronic cervicitis is one of the most frequently encountered physical disorders in women. Of 500 women eligible for treatment at the Garment Workers' Health Center in Dallas, Texas, 300 were examined by the internist from August 1, 1947, to February 1, 1949. Of this number, 150 had gynecological complaints. And, 95 (or almost one-third of the total number examined) had chronic cervicitis in various degrees. This includes varying forms of erosion, chronic cellulitis and fibrosis, cysts, polyps, lacerations with infection, eversion, and malignant changes.

## ETIOLOGY

The etiologic production of cervicitis is usually attributed to infection; however, there are cases of erosion of the cervix in which it is difficult to discover an infection as a preceding involvement. An alteration in the vaginal pH from its normal 4.5 favors growth of pathogenic bacteria. It is thought that the pH of the vagina may be the cause of obscure cases of erosion in young virgins. It is also felt by some gynecologists that tampons may influence the development of cervicitis in these nulliparous women.

The most common cause of cervicitis in multiparous women is labor and delivery. Infective processes are most often superimposed on some form of trauma such as that produced during childbirth with bruising

and lacerations, in some previous instrumentation, or as the result of an acute infection overwhelming the defense mechanisms. There is a resulting residue of bacteria in the endocervical glands and tissues of the portio vaginalis and adjacent structures. The chronic infective organism is usually a streptococcus but its invasion is usually made possible by an acute onslaught in which organisms such as *Neisseria gonorrhoeae*, *Escherichia coli*, pneumococci, some types of staphylococci, diphtheroids, *Mycobacterium tuberculosis*, and other less common bacteria, were producers of the initial acute process. The foregoing acute infection destroys the defense barriers of the tissues and allows the invasion of the streptococci. It is not known whether *Trichomonas vaginalis* and *Monilia albicans*, have an invasive property in themselves, but it is believed that they act in symbiosis with pathogenic bacteria and allow deeper chronic involvement. In chronic cervicitis, whatever the modus operandi, one of the streptococcus or staphylococcus groups will usually be the residual bacterial agent.

## PATHOLOGY

All types of cervical infections should be classified under the heading of cervicitis. Subheadings such as endocervicitis, erosion, and cystic cervicitis, merely designate the degree to which the pathologic process has advanced. Fundamentally, the progression of the tissue changes in all these conditions is quite similar. Infection is followed by congestion with hypersecretion of the cervical glands; granulation tissue is infiltrated with polymorphonuclear leukocytes and bacteria. There is desquamation of the squamous cells covering the portio and finally replacement by columnar epithelium. There is drainage of this infection by the extensive lymphatic system from the diseased cervix to the adjacent tissues, ligaments and organs; namely, the parametrium or broad and uterosacral ligaments, pelvic vessels, and urinary tract.

## SYMPTOMATOLOGY

Symptoms resulting from chronic cervical involvement may be purely local or



more extensively systemic. There is individual variation in the degree of distress. Rather extensive involvement of the cervix may produce surprisingly little discomfort in some cases and the diagnosis may be determined only by examination. In others, the involvement may be mild but symptoms are of an unwarranted severity. Leukorrhea usually accompanies any degree of chronic cervicitis and is the most frequent finding. Pruritis may be associated with the leukorrhea. Pelvic weight or heaviness is often aggravated by fatigue due to lymphatic and vascular congestion, and, if the paracervical ligaments are much involved, may result in actual pain in the lower abdomen on both sides. Dyspareunia is frequently complained of. Backache is usually due to uterosacral involvement. Urinary frequency and urgency are due to trigonitis. Menstrual irregularities or abnormalities and increased dysmenorrhea sometimes accompany chronic involvement. Metrorrhagia should lead to careful search for any possible early malignant process.

As recently pointed out by L. V. Dill<sup>2</sup> and Krohn *et al.*,<sup>9</sup> sterility is sometimes the result of cervical infections. Also, chronic cervicitis may act as a focus of infection in more remote regions, and last, and of utmost importance, cervicitis is definitely a precancerous lesion.

#### DIAGNOSIS

A general systemic examination is as essential in dealing with pelvic conditions as in dealing with conditions in any other system of the body. Leukorrhea is the most frequent symptom of cervicitis, and the nature of the discharge should be sought and its origin ascertained. Cultures and smears are advisable to determine the presence of *Neisseria gonorrhoeae*, *Trichomonas vaginalis* or *Monilia albicans*. There is likely to be a suggestive odor and consistency to the secretions associated with the foregoing types of infection. Malignant processes have an odor of necrotic tissue and the secretions may be watery and blood-stained.

Palpation should acquaint the examiner with the tone of the tissues of the vagina,

the thickening of supportive ligaments, and the position, size and consistency of the cervix, the fundus and the adnexae. Crawford, Collins and Weed<sup>10</sup> recently pointed out that moving the cervix from the right to left fornix, and left to right fornix, and then anteriorly, making the various ligaments taut, will reproduce the pains complained of in the lower abdomen and back. Lacerations and Nabothian cysts may possibly be more readily palpated than visualized. Palpation through the rectum is advisable as the adjacent cervical tissues and uterosacral and broad ligaments are often more accurately palpable by rectal than by vaginal examination.

With a good light and the vagina well exposed, inspection of the cervix should be for erosions, lacerations, edema, polyps, cysts, bleeding points and ulcerations. Endocervicitis may be difficult to demonstrate. The canal when dilated is granular and often soft. A thick tenacious mucopurulent or mucoid plug is seen coming from the canal. This material is difficult to dislodge. Retention or Nabothian cysts from following the plugging of the cervical glands by surrounding cervical infection. This will change the clear mucus to a thick purulent material. Eversions are accompanied by deep lacerations. The endocervical canal is hypertrophied and edematous.

Any reddened area about the cervix may be a carcinoma. There is nothing to distinguish grossly a benign from a malignant lesion. Both bleed when traumatized. It is advisable that tissue be removed for biopsy from all lesions of the cervix, particularly from papillary or polypoid growths, regions which tend to bleed after slight trauma, or obvious ulcers and areas of leukoplakia. It cannot be emphasized too greatly that biopsy and cytological smears should be used freely in the office.

#### TREATMENT

It is essential to correct any general physical deficiencies noted; that is, by use of nutrition, iron, vitamins, liver, estrogens, thyroid and sedation. Penicillin or sulfa drugs are to be given as indicated. To treat cervicitis, one must be aware of

the biologic characteristics of the normal vagina with particular relationship to the pH and vaginal flora.

Karnaky<sup>2</sup> noted that it was essential in cervicitis and vaginitis to produce a buffering effect so as to promote the reestablishment of the physiologically correct acidity (pH 4.5) and growth of Döderlein bacilli consistent with a healthy vagina. Roblee<sup>1</sup> noted that the addition of sulfa drugs to the pH factor was a great improvement in the management of cervicitis and vaginitis. He also obtained excellent results in the control of infections by the use of sulfonamides and buffered acid jelly, after cauterization or conization of the infected cervix. This jelly gives equally good results when used for mild cervicitis postpartally, or in preparation of the cervix before cauterization or surgery.

In the past two years, penicillin in oil and wax intramuscularly has been used for the treatment of chronic cervicitis. In more refractory cases and in badly diseased cervixes previous to surgery, penicillin in large doses, intramuscularly, may give good results.

It is also necessary in the treatment of chronic cervicitis to eradicate the lesion. Actual destruction by some form of heat treatment such as the nasal tip cautery or electrocoagulation is universally employed and may be used in a physician's office with good results and without too much discomfort to the patient. Best results are obtained with the nasal tip cautery in superficial lesions and Nabothian cysts. It is best to cauterize the endocervical canal at the midcycle with deep radial stripping incisions. In the topical cauterization of an ectropion or eversion, all areas are touched with the cautery tip until the areas turn a yellowish grey. Nabothian cysts are punctured and the cyst walls are cauterized. For cases of deep lying infections in the compound racemose glands of the endocervix, conization will completely remove the diseased tissue with no damage to the rest of the portio.<sup>8</sup> This is, however, not an office procedure.

In the multiparous woman with an ex-patients seen in this group had chronic cervicitis in various degrees. Further chronic cervicitis was encountered in two-thirds of all women seen with a gynecological finding.

It was noted that women who had had an abortion or had delivered one or more babies were more likely to have a cervicitis. This is in keeping with the universal understanding on this subject. It was also observed in the histories that very few of these women had had adequate postpartal tensively scarred, cystic, and infected cervix, extirpation is the soundest method of treatment, whether by amputation, or if there is any other pelvic pathology, a total hysterectomy would be advisable. Before surgery, the cervix should be cleaned insofar as possible with a multiple sulfa preparation and douches, occasionally cauterization, and in some more refractory cases, with penicillin.

#### ANALYSIS OF STUDY OF 300 WOMEN

As stated previously, in this series of 300 women, 95 or one-third of all the care. There were 11 nullipara and 84 parous women and 7 nulligravida and 88 women that had been pregnant.

As could be expected, the greatest number of women were in the third decade of life. There was 1 teenager, 17 in the twenties, 43 in the thirties, 26 in the fourth decade, and 8 were fifty years of age or over.

There were 62 white, and 33 colored patients. The gynecological complaints noted in order of their frequency were: vaginal discharge; pain in the lower abdomen; backache; urinary disturbances, namely, burning dysuria, frequency, incontinence, and nocturia; a heavy or dragging feeling in the pelvis and back; dysmenorrhea; excessive uterine bleeding; dyspareunia; pruritis; and irregular vaginal bleeding. The other findings or complaints noted by the internist in these women were: Menopausal symptoms, upper respiratory infections, nervousness, gastrointestinal complaints, fatigue, positive serology in five, and anemia.



Upon pelvic examination, 45 women had a relaxed perineum and 33 had cystoceles. In the cervicitis group and according to the degree of cervicitis, 29 had a mild cervicitis, 41 had a moderate cervicitis and 25 had an extensive degree of cervicitis. In 13 patients, the cervix was moderately enlarged and in 19, the cervix was markedly hypertrophied. Ten had a partial or total stenosis of the cervix. Nabothian cysts were encountered in 16, and marked lacerations were noted in 16. In 9 the cervix bled easily upon touch. Twelve patients had an associated vulvovaginitis of which 5 had senile changes, 6 had a *Trichomonas vaginalis* vaginitis and one had a *Monilia albicans* infection.

The uterus, but not the cervix, had been removed in 7 cases. The uterus was retrodisplaced in 19 patients, fixed in 4, enlarged in 39 and fibroids were noted in 12. Parametritis of varying degrees was noted in 37 patients at the time of their initial gynecological examination. Salpingitis was noted in 4 and enlarged or cystic ovaries were noted in 6. Five patients had had previous adnexal surgery and 1 had had a myomectomy.

During the early period of this series, vaginal or cervical cytology was not available; therefore, 26 of this group failed to have this procedure. Of the 69 that did have a cervical cytology, there were 5 positive and 64 negative reports. Of the 5 positives: (1) The repeat cytology was negative and 2 biopsies revealed a chronic cervicitis. (2) Repeat cytology was positive, but the biopsy showed a chronic cervicitis; however, a hysterectomy was recommended. (3) Repeat cytologies were negative. (4) Repeat cytology showed atypical cells and later was negative; a hysterectomy was done and sections of the cervix showed chronic cervicitis. (5) Repeat cytology was negative. Amputation of the cervix for biopsy was negative for carcinoma and many repeated cytologies have been negative.

In all patients in whom there was a suspicious lesion of the cervix, or atypical

cells were noted, repeated cytologies and biopsies were taken.

Sixteen cervical biopsies were taken of which 4 were negative, 8 showed chronic cervicitis, 1 polyp was found, 1 instance of keratosis of the cervix was noted and there were 2 papillomas. In 1 patient, the papilloma was described as being potentially malignant and a hysterectomy was recommended, but the patient declined. At follow-up examination, the cervix appeared healthy and cytological studies have been negative. In the other patient with a papilloma, a hysterectomy was done for other pathology and cervical sections were benign.

In keeping with the previous outline of therapy, 80 of the patients with chronic cervicitis were given triple sulfa vaginal cream\* or sulfa tablets, along with vinegar douches daily, and were asked to return in approximately four to six weeks, at which time the pelvis was reevaluated. In 5 patients, vinegar douches alone were recommended. In most instances, the patients were continued on the sulfa preparation and vinegar douches. In 1 instance, the patient was sensitive to the drug so the vaginal cream was changed with good results. In 5 patients with the associated senile vaginitis, an estrogen cream\*\* was used. In 3 patients with an associated *Trichomonas vaginalis* vaginitis vioform suppositories were used.

In view of the fact that penicillin is effective in the treatment of the various cocci, it was used in the refractory cases of cervicitis and also as indicated for other complicating conditions in these patients. Penicillin, 300,000 units in oil and wax, intramuscularly, was given once to 9 patients, twice to 6, and three or more times to 13 patients. In 5 of these patients, it was used in the treatment of syphilis. The use of penicillin is in keeping with the very recent work of Krohn *et al*<sup>9</sup> on the study of infertility and chronic endocervicitis.

In addition to the specific therapy for

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\*Triple Sulfa Cream (Ortho). Sulfathiazole and Beta Lactose (Upjohn)

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\*\*Dinestrol cream (Ortho).

cervicitis as noted above, the patients were instructed to take an adequate high protein diet, and were given vitamins, iron, liver, estrogens, thyroid, and sedatives for their systemic needs; many of these patients being nervous, debilitated, and having numerous menopausal complaints.

After the cervixes had been reevaluated following the use of multiple sulfa cream for four to six weeks, the more morbid cervixes were cauterized with the nasal tip cautery. Thirty-five cervixes were cauterized once, 10 were cauterized twice, 2 were cauterized three times and 1 four times.

In most instances, the patient returned after the first visit feeling very much better generally and with few of the previous complaints. The appearance of the cervix was improved and the thickening noted in the parametrium and about the uterosacral ligaments and subsided considerably. Of the 95 patients, 2 patients were not asked to return because of the mild nature of the cervicitis. Eighteen other patients did not return. Sixty-seven patients felt much better and 8 patients noted no improvement following the above therapy. Backache was definitely improved in 21 and remained about the same in 2. Thirty patients noted a definite improvement of the lower abdominal pain. The vaginal discharge cleared up completely in 15, and the parametritis had completely disappeared in 13.

The cervix was healthy in 20 patients. definitely improved in 18 and improved but with still some erosion, lacerations and hypertrophy in 16. No change was noted in the cervix of 3.

Hysterectomies were recommended in 18 patients with a badly diseased cervix, of which 12 had large uterine fibroids and 4 had adnexal complications. In the latter group of patients, in all instances, the cervix had greatly improved, but it was felt that the diseased organ would be better removed as it was potentially malignant and might also act as a foci of infection. In all instances in which the cervix was badly diseased, the uterus remained abnormally enlarged.

Sixteen patients had cervical biopsies; 1

had a *D & C* for menorrhagia with good results; and 1 patient with a positive cytology and badly diseased cervix had a *D & C* and amputation of the cervix. The biopsy was negative and the subsequent cytologies have been negative.

Four total hysterectomies were done; one for fibroids with excessive bleeding with good results; a vaginal hysterectomy for an enlarged uterus with excessive bleeding; and a papilloma of the cervix with good results. A total hysterectomy was done on a patient with fibroids, menorrhagia, and with two atypical cytologies reports—with good results and no malignancy. The other total hysterectomy was done for fibroids and menorrhagia with good results.

#### DISCUSSION

It is felt that with the use of triple sulfa vaginal cream or sulfa tablets, the milder types of chronic cervicitis may be treated and controlled; and in the more severely involved cervixes before and after cauterization and conization, these preparations will greatly help in reducing the foul odor, the discharge from slough, bleeding, stenosis from scar tissue formation, and in decreasing the healing time.

In cases of a chronic cervicitis in which a total hysterectomy is anticipated, the use of the sulfa drugs will reduce the chances of spillage of pathogenic organisms into the peritoneal cavity.

One must keep in mind that some patients may be sensitive to the sulfa preparations in which case other buffered preparations or antibiotics should be used.

Following either cauterization or conization of the cervix, the patient should be warned that there will be an increase in vaginal discharge which will persist for approximately two weeks. There may be bleeding as late as two weeks and at times this may be excessive. This is particularly true in severely diseased cervixes and following conization or amputation of the cervix. It may be necessary to hospitalize the patient to control the bleeding. The pelvic aches and urinary complications may be exaggerated for a few days, but usually subside after the cervix begins to heal. One should



also bear in mind that a cellulitis, pelvic abscess, or even a peritonitis may occur following these procedures and should be treated accordingly.

It is essential that the patient return for periodic postcauterization or postoperative dilatations of the cervix so as to prevent a stricture of the cervical canal. This may lead to a complete stenosis and a resulting pyometritis with a later need to remove the uterus. If recauterization of the cervix is necessary, this should wait for at least two or three months.

#### CONCLUSIONS

1. Chronic cervicitis is one of the most frequent physical disorders seen by the general practitioner or gynecologist.

2. Multiple sulfa preparations may be used with good results in the treatment of chronic cervicitis.

3. Multiple sulfa preparations are of great value in the postpartal state and in the precauterization and postcauterization and operative treatment of the cervix and the vagina.

4. Penicillin in oil and wax is effective in the more refractory cases.

5. Cauterization of the cervix is of great value in eradicating the infections in superficial lesions of the cervix and endocervix and in the treatment of eversions and Nabothian cysts.

6. In more deep-lying infections, conization, or amputation of the endocervix will give better results.

7. In extensively scarred, cystic, and infected cervixes, particularly if there is other pathology of the uterus, a total hysterectomy is advocated.

8. One must be constantly alert for the early detection of carcinoma of the uterus with the use of cervical cytology for screening purpose and biopsy examination of all suspicious lesions.

9. Correction of chronic cervicitis should assist in the reduction of malignant changes of the cervix.

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# NEW ORLEANS Medical and Surgical Journal

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## SOCIALISTIC LEGISLATION BEING CONSIDERED IN CONGRESS

The American people of today, never having lived under serfdom, are lightheartedly considering how they would trade liberty for security and lose freedom.

Each Congress in the past decade has had before it a greater number of bills calculated to accomplish this end. Not the least of these bills are three receiving attention during the early part of the second session of the 81st Congress.

HR Bill 6000 has already passed the House under special conditions under which it was arranged by the party in power that there should be a limitation of debate and no amendments accepted. This Bill is pri-

marily a most ambitious social welfare proposal. It does, however, contain one provision having serious medical implications, namely, that section on compulsory, contributory, permanent and total disability insurance. This insurance would supply total medical care to such a group of those disabled individuals who come under its scope.

The American Medical Association has gone on record as opposing the whole Bill. This position was reasonable and calculated to protect the interests of the profession, and particularly those of the nation as a whole, because with such an entering wedge, universal medical coverage by the State Medicine route would be just a matter of a few years and a few more Bills to manipulate it.

Other students of legislation have attacked the Bill on broad grounds. It is stated that the Bill is a replica of the British National Insurance law. It is also quite clear that if the Bill should become law, everyone would feel the burden of increased social security, taxes, or income taxes, or both. It is felt that no other piece of legislation now before Congress would rush us so fast toward national bankruptcy and federal control of our lives or families or incomes. No piece of legislation, since the federal income tax was made possible by an amendment to the constitution, would give the federal Government such power over the life of the individual. It is greatly to be hoped that representations made in behalf of organized medicine will be successful in preventing passage of this Bill, and also successful in bringing about an investigation of the whole situation of social security as it is proposed, and as it has been administered in recent years.

Another Bill of a serious and threatening character is the so-called, "School, Health Services Bill." This is S. 1411, which has passed the Senate, and is now pending before the House Interstate Commerce Committee. This Bill, if passed into law, would include a compulsory periodic examination of all school children at public expense, regardless of the financial status of the par-



ents. It further provides that, when indicated, treatment shall be provided, whenever the parents of such children are unable to provide treatment. It further states that a State health agency "may provide for the prevention and treatment of such physical and mental defects and conditions for all school children." It is clear that such a bill would indoctrinate 29,000,000 school children every year to accept the government dole. Investigation of the effects of this Bill show that it would add nothing to the child's welfare. It would place the direction of that medical care meant for the child under a central bureaucratic control.

For these reasons, the House of Delegates has reaffirmed its position taken previously that the Bill should be opposed as a whole.

A third Bill now waiting action is dangerous to the public and to medicine. This is the so-called "Federal Aid to Education" Bill, S. 1453, and its companion Bill HR. 5940. The Bill has passed the Senate and has been favorably acted upon in the House by the Interstate and Foreign Commerce Committee. It has been referred to the House Rules Committee with a recommendation for passage.

These Bills are predicated upon a presumed emergency in medical education, which is in fact fictitious, since the annual number of admissions to medical schools is now approximately 7000, compared to an average of 6,016 for the ten years preceding the War, and since the increase in the physician population from 1940 to 1948 was 14 per cent as against a 12 per cent increase in the general population. In other words, there has been a relative increase in physician population of more than 16 per cent. These Bills lay the groundwork not only for the nationalization of all existing and projected medical schools, but also for the nationalization for all existing and projected osteopathic, optometric, dental, dental hygiene, nursing, public health, and practical nursing schools. The possibility under the action of this Bill is the provision for federal scholarships in these various fields, which would allow for the subsidy of unqualified political ap-

pointees, and such would nullify the effort of admissions committees to maintain standards. One provision of the Bill would place the schools of nursing under a central board of certification, principally under the control of the Surgeon-General. A tentative list of accredited schools has already been prepared, the effect of which would be to legislate out of existence some 200 hospital schools of nursing, which would be excluded from the list. The total effect of this Bill would be to buy in within a very few years the whole field of medical education.

The House of Delegates of the AMA, at its recent meeting, has gone on record as opposing the Bill.

The proponents of socialization of medicine in the United States have advocated the passage of an omnibus socialization bill. This was S. 1679. As we well know, they have been unsuccessful in getting favorable action on this Bill. They have, however boldly announced that they will pass the Bill, one section at a time.

Consideration of such Bills as these three discussed here shows clearly that they fit into such a scheme. It is vitally necessary, therefore, that we inform our representative in Washington of the position that organized medicine has taken in opposing these three bills. It is our duty to the community, and in the interests of the profession that we strenuously oppose any legislation adapted to the plan expressed by the formula "Tax and tax. Spend and spend. Elect and elect."

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## NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The New Orleans Graduate Medical Assembly will have its Thirteenth Annual Meeting March 6-9, 1950.

It promises to be interesting and informative. In years past, physicians from near and far have had pleasure and benefit in attending. In recent years, attendance has been somewhat limited by difficulty in securing hotel reservations. As this situation

has improved somewhat, continued growth in the size of the meeting is expected.

Eighteen guest speakers, who are outstanding in their several fields, have been secured. Each will talk three times, and will cover a wide range of topics in the field of medical interest. As in the past, efforts have been made to have the various papers consider those aspects of medicine which are of daily significance to the practitioner. It would be well for those who plan to attend to secure hotel reservations promptly.

Following the meeting of the Assembly, a postclinical tour has been arranged. This year it covers San Juan, the Virgin Islands, the Dominican Republic, Jamaica, and Ha-

vana. The travelling is to be by air, leaving New Orleans, March 11, and returning to New Orleans, March 26. An excellent medical program is planned, with lectures, visits to hospitals, and the opportunity to observe tropical diseases and Public Health problems. Extensive sightseeing in this winter vacation land, time to shop, and plenty of leisure, and luxurious resort hotels, all combine to make this a memorable trip in the congenial companionship of the members of the profession and their families.

The New Orleans Graduate Medical Assembly continues to be of great service to physicians in covering the broad aspects of medicine.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### 1949 INTERIM MEETING OF AMA

Following is report submitted to the Executive Committee by delegates to the meeting of the AMA held in Washington, D. C. in December:

Your delegates, Dr. J. Q. Graves and Dr. Val Fuchs, attended the interim meeting of the House of Delegates of the American Medical Association in Washington, D. C., December 6-8, 1949.

The House was called to order by the Speaker, Dr. L. Borzell, at 10:00 a. m. sharp and the reference committee on credentials reported 179 delegates registered out of a possible 190. At the afternoon session on the first day this attendance was increased to 187 out of 190 accredited delegates which was one of the best attendance records for the House.

The first order of business was the award to the general practitioner of the year. The three names submitted were Dr. Andy Hall, Mt. Vernon, Illinois, Dr. L. Hare, Cedar Rapids, Iowa, and Dr. Thomas E. Rhine, Thornton, Arkansas. On the second ballot Dr. Andy Hall was declared winner.

The secretary gave his report and stated that 145,036 physicians are now carried on the rolls of the Association, an increase of practically 5,000 members over the previous year and 10,000 over the membership for 1947. The number of Fellows of the Association also showed a gratifying increase; there being 81,053 on September 1, 1949 as compared with 77,816 on the same date in 1948 and 75,424 in 1947.

Amendments to the Constitution and By-Laws, as approved by the House of Delegates at a previous meeting, were adopted.

The report of the Board of Trustees was a very lengthy one and in it a suggestion was made that reconsideration be given by the House to the report of the reference committee adopted on June 9, 1949 so that the section in regard to general practice sections in hospitals be revised to the effect that such sections be recommended to hospitals and not made mandatory.

Committees were in session on Tuesday afternoon and all day Wednesday and reports were presented at the Thursday morning session. This was an unusual procedure since the House of Delegates is sup-



posed to meet on the afternoon of the second day to receive all committee reports, however due to inability to secure space in which to hold this meeting it was deferred until the morning of the third day.

The House adopted a resolution authorizing the Board of Trustees to set dues up to a maximum of twenty-five dollars per year. This is to be a yearly provision and the recommendation was made, approved and adopted that the dues for 1950 will be twenty-five dollars. This does not include Fellowship dues of twelve dollars which entitles a doctor to receive the Journal of the AMA. In other words Fellowship dues and subscription to the Journal are in addition to membership dues. It is also understood than any man who is excused from paying dues in his local state society is also exempt from dues in the AMA. Again, any man who is delinquent in payment of dues to the AMA for a period of thirteen months will be dropped from membership in the AMA but this will have no effect on his state and local society membership. It was agreed that the state societies should be asked to collect these dues.

Senate Bill 1411, the "School Health Service Act" was acted upon as follows: "We recommend that this bill in its present form be opposed. On page 6 of the printed bill, Section 6 (a), (1) there are three provisions, A, B and C. A provides for periodic medical and dental examination of school children; B provides that, where indicated, treatment shall be provided 'whenever the parents of such children are unable to provide treatment' and these sections are acceptable. Section C, which permits schools to provide treatment for *all* school children, is an unwise provision and makes it necessary to oppose S. 1411."

In regard to House Bill 6000, "the AMA recognizes the need for assistance to the disabled needy and feels that this aid should always be administered on a local level. Financial assistance to the locality should only be advanced from state or federal sources when a need can be clearly shown."

Several states have developed programs

whereby patients can present grievances to committees of their respective associations and it was recommended that all states adopt comparable programs at the earliest possible time.

The name of "Hygeia" has been changed to "Today's Health" with Dr. W. W. Bauer, as Editor and Dr. William Bolton, as Associate Editor. Ellwood Douglass continues as Managing Editor of the magazine.

Group health and hospital programs were again stressed and a resolution was passed making it compulsory to have approval of both the state and local medical society for AMA approval. It was also made mandatory that such organizations complete one year's function before the AMA seal of approval will be extended.

National Commander George N. Craig, of the American Legion, appeared before the House and assured the members that the American Legion will strongly support the American Medical Association's anti-administration battle. He stated that Oscar R. Ewing and other proponents of the federal health plan should be told "We have just begun to fight".

A resolution was passed requesting information on the present state of preparation for civil defense in connection with medical and health problems.

The group recommended the construction of a new Army Medical Library Building. It also urged raises for public health officers both local and federal.

The Air Force was recognized as a separate arm of the Defense Department and it will be permitted a delegate in all future meetings.

Senate Bill 1453, providing financial aid for medical schools was opposed on the ground that federal control would result.

A committee was named to study non-service connected disability as now provided by the Veterans Administration with the idea of ascertaining how this service can be given under private care.

There was approval by the House of another resolution which declared that there is "urgent need for a national blood program capable of immediate expansion in

event of a local disaster or a national emergency". The Red Cross was named as the proper agency to handle this.

The total registration at this meeting was 8,487, which included 4,258 physicians and 4,229 guests.

Louisiana was fortunate in having both

of its delegates appointed to committees; Dr. Graves to the Committee on Blood Bank and Dr. Fuchs to the Committee on Miscellaneous Business.

VAL H. FUCHS, M. D.

J. Q. GRAVES, M. D.

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## LOUISIANA STATE MEDICAL SOCIETY NEWS

### C A L E N D A R

#### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

Louisiana physicians and surgeons have been invited to attend a three-day seminar on cancer which will be held at the Medical College of Alabama in Birmingham on February 21, 22 and 23.

It will be conducted by at least ten specialists widely recognized for their work in their various fields and will give doctors the opportunity of hearing comprehensive expositions of the most modern and effective methods of cancer detection, diagnosis and treatment.

The seminar will be the first large scale session of its kind ever conducted in Alabama. It is being sponsored jointly by the Medical Association of Alabama, the Jefferson County Medical Society, the Extension Division of the University of Alabama and the Alabama Division of the American Cancer Society.

Several hundred doctors are expected to attend. Invitations are being extended to members of all state and county medical societies throughout the Southeast and out-of-state representation likely will be large. There will be no registration fee.

Dr. Karl F. Kesmodel, of Birmingham, Chairman of the American Cancer Society's Committee on Arrangements, said that the program had been arranged to give doctors up-to-the-minute information they indicated they wanted most on new and advanced methods of detection, diagnosis and treatment.

"The committee also has kept in mind," Dr. Kesmodel said, "the dissimilar problems that confront the specialist and the general practitioner. The subjects and the method of presentation will give them information most useful to both of them."

The first day's sessions will be climaxed by a dinner at Hotel Tutwiler at which the speaker will

be Dr. Charles S. Cameron, Jr., of New York, Medical and Scientific Director of the American Cancer Society.

Reservations for the seminar should be made through Dr. Kesmodel at this offices in the Medical Arts Building in Birmingham. Hotel reservations, however, should be made direct with the headquarters hotel, The Tutwiler, or with Hotel Molton or Hotel Redmont which are nearby.

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#### NEWS ITEMS

The annual Neuropsychiatric meeting at the VA Hospital, North Little Rock, Arkansas, for 1950 will be held at that hospital on February 23-24, 1950. A number of nationally known leaders in neuropsychiatry and related fields are expected to participate, including Drs. Walter Alvarez, Daniel Blain, Edwin F. Gildea, Karl Menninger, John N. Rosen, and others. There will be no charge for registration and attendance of all interested personnel will be welcomed. Further information may be obtained by writing to the Director of Professional Education, VA Hospital, North Little Rock, Arkansas.

Dr. Charles Huggins, Professor of Surgery, The University of Chicago, is going to give the second annual Oncology Lecture sponsored by Louisiana State University School of Medicine on Tuesday evening, February 28, 1950 at 8:15 p. m., in the Auditorium of Charity Hospital. The title of his paper is "Significance of Serum Proteins in the Diagnosis of Disease".

The medical profession is cordially invited to attend.

**Send Request for Hotel Reservations, During Annual Meeting, to Dr. Edward G. Cailleteau, 316 Louisiana National Bank Bldg., Baton Rouge, La.**



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The Bi-Parish Medical Society met in the Educational room of the Clinton Baptist Church, Clinton, La., December 14, 1949. After an excellent dinner prepared by Mrs. Willie B. Hubbs and assistants, we went into the business and scientific program.

Election of officers for 1950 resulted as follows: President, Dr. L. F. Magruder, Jackson, La.; Vice-President, Dr. L. R. Young, Jackson, La.; Secretary-Treasurer, Dr. E. M. Toler, Clinton, La.

Delegates to the Louisiana State Medical Society meeting—Dr. E. M. Toler, Clinton, La., and Alternate, Dr. C. S. Toler, Clinton, La.

Dr. C. S. Toler read an interesting and instructive paper on some of the recent drugs, such as, penicillin, streptomycin and the sulfonamides. The paper was favorably discussed by members present.

Mr. Jack Craig of Baton Rouge, La., representative of E. R. Squibb and Sons gave us instructive informative presentation on nutrition and vitamin deficiencies, which was favorably received by the guests and profession.

Several new members were added to our corps of physicians.

The Society adjourned to meet in the East Louisiana State Hospital, the first Wednesday of March, 1950.

A meeting of the Webster Parish Medical Society was held at the Minden Sanitarium, at 7:30 p. m., Tuesday, December 6, 1949.

A turkey supper was served the doctors by the Sanitarium. There were present 13 members of the Society and two visitors from outside the Parish.

Representatives from the Board of the Webster Parish Welfare Department met with the doctors and discussed a plan to have a rotating board of three doctors examine the applicants for welfare disability assistance once a month. The plan was approved and in the future three doctors will serve at Springhill and three at Minden.

Dr. Ralph Riggs of Shreveport gave a talk on treatment of injuries of the nose and face. This talk was illustrated with lantern slides.

Dr. L. B. Van Horn was elected a new member of the Society.

Election of officers to serve for 1950 was held with the following results: Dr. W. R. Garrett of Springhill was elected President, Dr. James Boren of Springhill was elected Vice-President. Dr. C. M. Baker of Minden was re-elected Secretary-Treasurer. Dr. C. M. Baker was elected Delegate to the State Meeting with Dr. T. A. Richardson as Alternate.

### SPECIAL REQUEST

Supply of August, 1949 and September, 1949 issues of the Journal is exhausted, and it is requested that doctors who have no more use for their copies send them to the office of the Journal.

### STAFF OF ST. PATRICK'S HOSPITAL IN MEMORIAM

The Staff of St. Patrick's Hospital recognizes a great loss to the profession in the recent death of one of its outstanding members, Thomas Henry Watkins.

Dr. Watkins, who died October 29, 1949, was admired by all of us for his devotion to our profession, his untiring energy, his charity and fidelity and his kind and considerate assistance given the younger men of the profession.

With Dr. Watkins' demise we recognize the termination of an era in the practice of medicine of which he was typical, that is, the transition from the "horse and buggy" stage to the development of modern medical practice. He learned surgery without having formal training because there was no formal training available. He studied and observed until he was certain of his ability to carry out certain procedures with alacrity and confidence. Ultimately his eminence as a surgeon became well known in the city as well as in the far reaches of the surrounding countryside.

Dr. Watkins' ability as a business man and his integrity were recognized throughout this section. As evidence we point to his position on boards of directors of financial institutions and his office as president of one.

Our profession must live in those of us who carry on its tasks today, but it must draw no small measure of inspiration from the example of those who have gone before, and have passed on to greater fields. Let us, in contemplating their departure, resolve so to conduct our own lives as to pass that inspiration on undimmed to those who in their turn shall follow us.

## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

### LOUISIANA STATE MEDICAL SOCIETY WOMAN'S AUXILIARY

At the December meeting of the Woman's Auxiliary to the Orleans Parish Medical Society, Mrs. Boni J. De Laureal as President succeeding Mrs. Edwin A. Socola. Following are members of the Board for 1950: President-Elect Mrs. John T. Sanders; 1st Vice-President, Mrs. C. J. Brown; 2nd Vice-President, Mrs. Daniel N. Silverman; 3rd Vice-President, Mrs. William H. Gillentine; 4th Vice-President, Mrs. Edwin H. Lawson; Recording Secretary, Mrs. Edwin S. Kagy; Corresponding Secretary, Mrs. Robert E. Rougelot, Jr.; Publicity, Mrs. George D. Feldner; Treasurer, Mrs. Robert C. Kelleher; Parliamentarian, Mrs. C. Grenes Cole; Historian, Mrs. Tracey T. Gately.

Chairmen of Standing Committees are—Program, Mrs. Anees Mogabgab; Notification, Mrs. Joseph S. D'Antoni; Hostess, Mrs. Jerome E. Landry; Registration, Mrs. J. Morgan Lyons; Membership, Mrs. Richard W. Vincent; Courtesy, Mrs. Cuthbert J. Brown; Telephone and Motor Corps, Mrs. Eugene H. Countiss; Revisions, Mrs. Monte F. Meyer; Archives, Mrs. Edwin R. Guidry; Contact, Mrs. Edwin H. Lawson; Medical Culture, Mrs. Herman G. Gessner; Clothes, Mrs. Lloyd J. Kuhn; Samples, Mrs. Norton W. Voorhies; Public Relations, Mrs. Jules Myron Davidson; Commemoration, Mrs. Carroll F. Gelbke; Printing and Supplies, Mrs. H. Theodore Simon; Red Cross, Mrs. Frederick Fenno; Cancer, Mrs. Louis Leggio; American Heart, Mrs. Willard R. Wirth; Tuberculosis, Mrs. Daniel N. Silverman; Periodic Health, Mrs. Cassius L. Peacock; AMA Bulletin, Mrs. Edwin A. Socola; Honorary Board Member, Mrs. John S. Dunn.

The work of the committees on Clothes and Samples is very interesting. Both of these worthwhile projects have been active ones with the Orleans Auxiliary for many years.

The Clothes Committee collects used clothing from the members of the Orleans Parish Auxiliary and distributes them to needy medical students. Both men and women's garments are collected as occasionally there are requests from girl medical students. In the majority of cases, the calls for clothes are from G.I. students. In one instance, this committee also furnished a bicycle to an ex-G.I. who had suffered a leg injury. He could not walk the distance to and from the medical school, and he could not afford car-fare. All types of clothing—from sport and business to evening clothes are obtained. On occasion, the Auxiliary also has furnished these students with tickets to operas, concerts, etc.

The Committee on Samples collects any medical samples that the doctors are given by the drug houses and for which they have no use. These in turn are distributed to various institutions and

asylums in New Orleans. The samples are carefully sorted, usually by the chairman's husband and only such items as requested by the institutions are given and then only after permission from the attending doctor.

The Woman's Auxiliary to the Tangipahoa Parish Medical Society met in December at the home of Mrs. I. I. Rosen in Springfield. A report was given on the nurse recruitment program. Mrs. C. B. Scott of Ponchatoula, a former instructor in the School of Nursing at Baptist Hospital, Memphis, Tennessee, gave a report on an address she had made. Mrs. Scott had spoken to the girls of the Albany High School on the subject "Nursing As A Career". It was demonstrated by a film, "This Is Your Life."

The Woman's Auxiliary to the Jefferson Davis Parish Medical Society used Christmas as the focal point of its December meeting. The program consisted of a Christmas reading "The Littlest Angel" by Mrs. Jay Baker.

The December meeting of the Woman's Auxiliary to the Lafayette Parish Medical Society centered around Christmas. Each member brought a gift to be given to the children at the Lafayette Charity Hospital. Approximately one hundred gifts from members and friends of the Auxiliary were sent the hospital. For a long time this Auxiliary has been interested in helping children at the Charity Hospital. Earlier in the year the Auxiliary made a contribution to the Lafayette Charity Hospital Service Guild to help support the "toy bank" maintained for children at the hospital. During the summer the Auxiliary also sponsored a "Treat Day" for all the patients of the hospital.

The Woman's Auxiliary to the Lafayette Parish Medical Society has given a year's subscription to each of the 20 schools in the parish. The Auxiliary also plans to continue its nurse recruitment program. Last spring the Auxiliary gave a tea in honor of the senior high school girls at which talks were made by a medical technician and a registered nurse. The latter discussed their professions as possible vocations for the girls. They explained the entrance requirements, courses of study and expenses. The tea was most successful and the Auxiliary decided to make it an annual event.

Last May the Auxiliary sponsored a style show for the benefit of the American Cancer Society. The show was held in the gymnasium of Southwestern Louisiana Institute which was filled with an enthusiastic group.

Mrs. Daniel M. Kingsley,  
Chairman,  
Press and Publicity.



## BOOK REVIEWS

*Acute Appendicitis and Its Complications:* By Frederick Fitzherbert Boyce, M. D., New York, Oxford University Press, 1949. Pp. 487. Price, \$8.75.

This monograph on acute appendicitis and its complications deserves a place with such classic monographs on appendicitis as those written by Royster and Kelly. The general practitioner and the medical student will find it particularly valuable.

The book is most timely in view of the unwarranted complacent attitude towards appendicitis and its complications which has developed widely as a result of a feeling of security and over-reliance on chemotherapy, blood transfusions and improved anesthesia.

The volume represents a prodigious amount of work done in studying the records of patients with acute appendicitis at the Charity Hospital in New Orleans, reviewing the literature on acute appendicitis and summarizing the critical thought of the author and other observers on the protean manifestations and the vexing problems of management of the commonest acute surgical disease of the abdomen.

The book is lucidly written with arrangement of material in excellent fashion. There are many fine illustrations throughout.

AMBROSE H. STORCK, M. D.

*Pollen Slide Studies:* By Grafton Tyler Brown, M. D., F. A. C. P. Springfield, Ill., Charles C. Thomas, 1949. Pp. 122, illus. Price, \$6.00.

This small book contains all that is necessary to permit aerobiologic surveys in any community in the United States. The drawings of pollen grains and fungus spores are accurate, the photographs are excellent and the descriptions are precise. There are about one hundred drawings and microphotographs which make up a splendid atlas.

Study of the monograph will enable any physician or technician to identify and count the important pollen grains and larger fungus spores which are present in the air. The book is recommended without reservation.

VINCENT J. DERBES, M. D.

*Medicine of the Year:* Edited by John B. Youmans, M. D. Philadelphia, J. B. Lippincott Company, 1949. Pp. 143. Price, \$5.00.

Because of the many yearbooks and annual reviews of medicine now being published, one might question the need of another such volume. How-

ever, in reading this first issue of *MEDICINE OF THE YEAR*, one cannot help but welcome this addition. The review includes advances in all fields of medicine divided with reference to specialty. The emphasis is on the therapeutic advances which have proven worthwhile in the last year, although changing ideas in pathogenesis, etc., are presented. There is no accumulation of disjointed facts as is often found in such reviews, but the material is clearly and concisely presented in narrative form, with pertinent references at the end of each chapter. The form of presentation, (large, bold print, double columns, flat, non-cumbersome volume of one hundred and forty-three pages), allows for pleasant expeditious reading, and is a ready source of usable information. When reading this refreshing review, one is convinced that the editors have succeeded in their object to "provide the practitioner with a readable, brief, concise presentation of the changing events in medicine during the preceding year and help him keep abreast of progress."

E. W. A. OCHSNER, JR., M. D.

## PUBLICATIONS RECEIVED

W. B. Saunders Company, Philadelphia: *Physiology of Heat Regulation and the Science of Clothing*, Edited by L. H. Newburgh, M. D. *Medical State Board—Questions and Answers*, by R. Max Goepf, M. D., and Harrison F. Flippin, M. D., Eighth Edition. *Electrocardiography—Fundamentals and Clinical Application*, by Louis Wolff, M. D., Illustrated. *Clinical Pathology—Application and Interpretation*, by Benjamin B. Wells, M. D., Ph. D., Illustrated.

Charles C. Thomas, Springfield, Illinois: *Principles and Practice of Therapeutic Exercises*, by Hans Kraus, M. D. *Intestinal Intubation*, by Meyer O. Cantor, M. D., F. A. C. S. *Congenital Anomalies of the Heart and Great Vessels*, by Thomas J. Dry, M. D., Jesse E. Edwards, M. D., Robert L. Parker, M. D., Howard B. Burchell, M. D., H. Milton Rogers, M. D., and Arthur H. Bulbulian, D. D. *Helpful Hints to the Diabetic*, by William S. Collens, M. D., and Louis C. Boas, M. D. *Haemolytic Disease of the Newborn*, by M. M. Pickles, M. D.

University Medical Publishers, Palo Alto, California: *Handbook of Medical Management*, by Milton Chatton, M. D., Sheldon Margen, M. D., and Henry D. Brainerd, M. D., First Edition.

Harcourt, Brace and Company, New York: *Human Growth, The Story of How Life Begins and Goes On*, by Lester F. Beck, Ph. D.

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### THE INJUDICIOUS USE OF INTRA- NASAL MEDICATION\*

A. J. McCOMISKEY, M. D.

NEW ORLEANS

I have always felt a little reluctant to speak at an allergy meeting for I am not, as most of you know, a "Simon pure" allergist, but rather profess to be an otorhinologist. It would take far more than ten minutes for me to tell you what I think, or rather what I do not think, of nose drops, but I shall attempt to keep within my time limit. I am not going to speak to you about osmosis, and Ph; that would take up all the time allotted me besides it can be found in many articles by Fabricant and others, but am going to limit myself to a few practical personal experiences and hope that from them you can get at least one point to think over.

Almost every day there comes to my office some patient with a completely stopped up nose. From the moment they begin to speak it is easy to tell that they have absolutely no nasal airway which is essential for good voice resonance. Their histories are usually very similar and date back to a cold or attack of hayfever several months before, but which failed to clear up in the usual period of time. Then they consulted first one physician then another, each giving relief for a while only to have the symptoms return. Often the story includes complete allergic skin testing and a history of

repeated hypodermic medication over a varying length of time, but usually ends with the remark "and now I am using these drops, but they don't give me much relief any more, they used to keep my nose open when I used them three times a day, but now I use them every twenty minutes and can't breathe. I carry a bottle with me, have a bottle at my office, and keep another bottle under my pillow."

Intranasal examination of these cases reveals a mucosa that is devoid of color, swollen, pale, and edematous to the point that it is in apposition with the septum, with a thin, watery discharge, the nose blocked so tightly that even a tooth pick could not be passed through it. Use of an astringent usually brings the swelling down and reveals a septum that is fairly straight and not unduly thickened, turbinates that shrink to their normal size revealing no evidence of cyst formation, no polypi, and no pust indicative of sinus infection.

The keynote of the history is the fact that the blocking has occurred without any correlation to pollination, and that no purulent material is blown from the nose. Transillumination usually reveals antra and frontals completely clear to light. Occasionally, while their tissues are shrunken the antra can be easily and painlessly washed out through the natural ostia and the washings are almost always clear of purulent material.

Within a few moments after the astringent has been applied the patient is usually relieved in breathing, begins to lose his nervous tension and wants to know the name of the medicine used so he can get some to

\*Presented at the Sixty-ninth Annual Meeting of the Louisiana State Medical Society, May 7, 1947.



put into his nose. When you tell him you intend to keep his nose open without any drops he usually snickers and then looks at you as though he thought you were "off the beam", and says, "Well Doc I'll surely suffocate tonight." Then your ability as a salesman really comes into play. I explain to them that whereas his trouble may have begun as a cold, sinus attack, or hayfever, his original trouble has probably cleared up and he is now getting a reaction from too many drops. I try to impress upon him the fact that I could order a dozen different drops to open his nose, but for every bit he shrinks it today, will be followed by a compensatory swelling tomorrow. The second day he would have to use more drops, and the swelling would be worse on the third day, until a vicious circle sets in, whereby he has to use the drops to breathe, and the more drops he puts in, the more swelling he will have the next day. If he would refrain from putting anything into his nose for forty-eight hours, he would notice some improvement. At the end of a week he would be breathing on his own, and within two weeks it should feel almost like a new nose.

As long as the patient is moving about in the daytime he gets along pretty well, aided, if practical, by the application of hot towels across the bridge of the nose, cheekbones and forehead for about five minutes at a time, three or four times a day to increase circulation. But absolutely nothing is to be put into the nose, and it is wise to specify, "no drops, inhalators, douches, irrigations, or any intranasal medication whatsoever", for they are just as prone not to put any drops in, but to sniff on a benzedrine inhalator all day. The nights are worse than the days and they must be given a sedative for the first two or three nights. I insist on the sedation early, and request that it be taken about one-half hour before the evening meal, so that they will get full absorption from it, will be pleasantly relaxed, and can retire shortly after dinner and get some rest even though they do have to breathe through the mouth for the first two nights. In addition, I give a small

dose of catarrhal vaccine combined with some nonspecific protein for its immediate reaction.

As soon as the reactionary swelling has subsided sufficiently to permit a thorough examination of the nose, it is made certain that there is no active sinus infection producing congestion of the turbinates. Often a deviated septum or a dislocated quadrangular cartilage acting as a bottle neck will be the causative factor in starting the patient on drops. Sometimes the middle turbinates will become cystic in character and grow to many times their normal size, blocking the entire upper half of the nose and causing constant dull headaches, at other times the nose will be blocked by nasal polypi. Frequently there is but one big polyp on either side. Other cases may show numerous polypi springing from one or both ethmoidal areas, which must be cleaned out at the first opportunity. How anyone can expect drops or vaccines, or the combination of them, to get rid of a polyp as big as the thumb, is beyond me and yet I have seen such cases, many, many times. The use of a snare will remove the growth in a few moments, and they are then returned to the allergist for follow up treatments in an effort to remove the underlying allergic factors. I always make an earnest effort to remove every bit of the polypoid material or "roots" as possible, although I have heard one of our prominent allergists state that he does not bother to clean them out so thoroughly but relies upon his extracts to cause a complete atrophy or disappearance. That has not been my personal experience.

The same applies for a badly deviated septum or enlarged middle turbinates. No amount of drops will cause any permanent reduction in size any more than drops would straighten a crooked leg or arm. The prolonged use of intranasal medication beyond the fifth and seventh day will cause a reactionary swelling to the drops used, not to mention the nervousness, irritability, and loss of sleep caused by medication that contains ephedrine or one of its allied salts. There should be more cooperation between

the allergist and rhinologist. The consulting of one with the other is no reflection upon the ability of either, and should be resorted to more frequently, to the benefit of all concerned. Also, the allergist should use his head mirror as often as his stethoscope and learn to differentiate between an allergic membrane and an inflamed membrane; the difference between a membrane irritated by chemicals and one due to pollinosis; whether obstruction is due to allergic reaction or mechanical blockage, such as foreign bodies, tumors, polypi, or bony malformations, before ordering any intranasal medication. After all, if we have faith in our vaccines, why rely at all on drops.

To me, ordering nose drops is cutting the knot, not untying it, or really correcting the condition. I very, very rarely, order drops of any kind, but when a patient does ask for them, that little still voice within me says, "Brother you have failed". If you had corrected his underlying pathology he would not want them in the first place, and nothing is more pitiful than the patient who has become addicted to drops with cocaine. Surely they must make the patient feel like he owns the world for a while, but their prolonged use will certainly tell on his health in time to come.

Lastly, I should call to your attention the number of cases of impaired hearing resulting from drops getting into the eustachian tubes. We get a third of our hearing through the nose, via the eustachian tubes. Just one drop of medication can block an eustachian orifice and make us feel like the "head is in a barrel", but to add to our troubles the drops irritate the mucosa calling forth a pale, watery secretion, the membranes swell until no drainage is possible, the fluid, usually sterile increases until the middle ear becomes filled. Often the patient will tell you the only way he can get relief is when he puts his head down as though to tie his shoe. This permits the fluid to run up into the attic away from the drum. Examination of the drum shows no inflammation, a fair light reflex, but usually a glazed or camphor appearance of the drumhead. On catheterization of the

eustachian tubes a crackling of the fluid can be heard. We have developed small suction tubes which can be placed through a catheter into the eustachian tube or middle ear and the drops or fluid removed, but in other cases the exudate is so great that paracentesis with aspiration of fluid is necessary to permit the ear to become dry and healthy again. Under sterile precautions this is neither painful nor harmful and the drum has always healed over again, in fact too quickly, usually within forty-eight to seventy-two hours. I believe we could get a better result and quicker cure if the drum would stay open longer and permit better drainage.

Until Hasiltine, Fabricant, Proetz, and others called attention to the physiology of the nasal mucosa, stronger and stronger medications were used. Now however, the reputable manufacturers are trying to bring out a drop as nearly devoid of secondary reaction as possible, although the optimum has not been reached.

The newer antibiotics are wonderful for infections. In my own office practice, we make up most of our solutions without combining an astringent, for in most cases it is the astringent and not the antibiotic that gives the secondary swelling, though I realize that many antibiotics do give allergic manifestations, which time will not permit discussing. I believe this summer will see the use of many of the recently developed antihistaminic drugs in the form of nose drops, probably more helpful and less irritating than anything that has been used in the past, but again, I feel that their *prolonged* or *too frequent* use will cause the mucosa to swell and block and bring on a chain of symptoms similar to the conditions which they are intended to relieve.

So in closing, let me say, that if you must use nose drops win the patient's cooperation to use them as little as possible, and he will learn to love you for it.

Just because the nose is the only ostium in the body without a natural sphincter is no reason why we should be forever ravishing it by poking all sorts of things into it.



## DISCUSSION

Dr. Stanley Cohen (New Orleans): Dr. McComiskey, I want to thank you for that delightful paper which has pointed out to us the frequency of improper therapy in vasomotor rhinitis.

The type of rhinitis which is most likely to produce obstruction, and it is obstruction, for which most nose drops are prescribed, is a very interesting type of vasomotor rhinitis. These people usually complain of obstruction, have a minimum of sneezing and nasal itching, have negative skin tests and, remarkably enough, show an exceedingly high incidence of psychosomatic complaints. They react poorly to nasal medication and immunological therapy. They all present a most unusual psychiatric picture. In addition to having obstruction, 90 per cent complain of fatigue of a neurotic nature, depression, and they lack drive and energy output. Johnny Mitchel in Columbus, Ohio, has compared a large series of these patients with another group having allergic rhinitis. The former fall into a group of patients with a high incidence of multiple neurotic complaints. They may or may not have eosinophiles in their nasal secretion. They have the proclivity par excellence to produce nasal polyps. I am convinced that a proper approach to the treatment of vasomotor rhinitis manifested by obstruction with a minimum of sneezing and itching is not with the use of nose drops. My experience indicates that this type of vasomotor rhinitis is actually the somatic part of a psychosomatic disease.

Dr. J. Dudley Youman (Shreveport, La.): The interesting point the doctor brought out was the fatigue he notices in his patients. Many eosinophiles were found in the nasal secretion and I wonder if there's an underlying food allergy. Randolph has done much work on fatigue due to allergy. Many of his patients have gone from doctor to doctor and have been classified as psychoneurotics and have gotten no relief. According to him, with his individual food tests, he has been able to reproduce the reactions of fatigue in his office.

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## THE MANAGEMENT OF NASAL INJURIES

RALPH H. RIGGS, M. D.

SHREVEPORT

The work and teaching of the Fomon Group has been directly and indirectly responsible for most of the enthusiasm in the past few years concerning this subject. Textbooks as late as 1945 mention the treat-

ment of nasal injuries in less than one page of print. Certainly, since we now have a better understanding of the anatomy and physiology of the nose, it behooves all of us to get better results both from the standpoint of function and cosmesis.

Unfortunately, nasal injuries do not always receive the attention they merit. The simple types are apt to be treated as trivialities at the time of the accident, or may be entirely overlooked, while the more complicated ones, not infrequently being accompanied by more serious injuries, are necessarily neglected because of more urgent claims of the associated conditions. Improper management often results in serious consequences. In addition to producing deformity, they may lead to obstruction of the airways, and in the case of children, may interfere with the normal development of the nasal framework. If a deformity in a child is a definite menace to health or is having a bad psychological effect, corrective measures should not be delayed; otherwise, it is better to await the full development of the nose (approximately the seventeenth year).

## ANATOMY

As you know, the nose is composed of a framework and a covering. The framework consists of the nasal bones, the septum (cartilage and bone), the upper lateral cartilages (which are really an extension of the septal cartilage), and the lower lateral cartilages. The medial crura of the latter cartilages help form the columella. The membranous septum is the area between the columella and caudal end of the cartilaginous septum.

The interior of the nose is covered with mucous membrane except in the vestibule, where skin is found. The covering externally is skin with very little subcutaneous tissue.

The blood and nerve supplies will not be dealt with in detail, except to state that they are very generous.

## PHYSIOLOGY

Books have been written dealing with its function. I will limit my discussion to the

mechanism of air currents and their physiological importance.

Proetz has described the inspiratory current as a parabolic curve, the nares being dependent, and the piriform opening being at a somewhat higher level. The air current goes upward, backward and then downward to emerge through the posterior openings. Normally the anterior opening is slightly smaller than the posterior one and thereby a negative pressure of approximately 6 mm. of water is produced on inspiration and a positive pressure of approximately 6 mm. of water on expiration.

#### LEGENDS

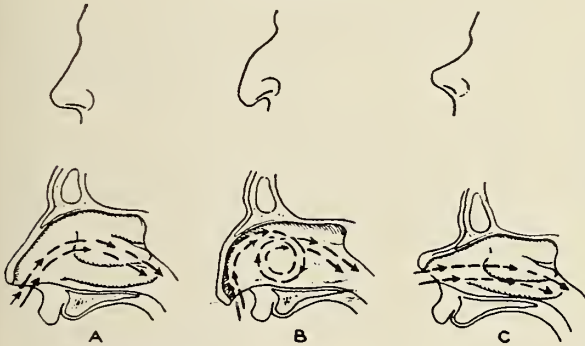


Fig. 1. Inspiratory current: (a), normal parabolic curve. (b), impingement of the inspiratory current on the dorsum and formation of eddies in the case of the dependent tip. (c) flattening of the arch and more direct course of the current in the case of unduly elevated nares.

Proetz also states that as long as the ostia of the sinuses are at all patent, the pressures changes in the sinuses are identical with those in the nose. An abnormal nose may, therefore, interfere with drainage of the sinuses and its consequences. All portions of the nasal fossa should be accessible to the air currents and in a proper proportion. Without this we may have a chain of symptoms marked by anosmia, headaches, metaplasia, and infection.

The position of the upper and lower lateral cartilages in relation to the nasal septum plays a very important role in producing the normal direction of air currents. They normally help regulate the size of the piriform opening which in turn admits the necessary amount of air into the nasal cavity.

#### TYPES AND MECHANISM OF NASAL INJURIES

The exposed position of the structures forming the nasal pyramid renders them more subject to traumatism than other parts of the face. Injuries may involve any and all of the elements of the pyramid. There may be fractures of all degrees: greenstick, displaced, comminuted, overriding or compounded.

Nasal injuries and fractures almost invariably result from direct violence. Their character and extent will depend for the most part upon the angle at which the force was applied, the amount of trauma, and the size and shape of the traumatizing agent. Injuries may occur from either side, from in front, above, or from below.

The nasal septum, due to its position, is practically always involved in any malposition of the external parts. If the trauma is over the cartilaginous framework the septum may be fractured, with comminution, impaction, and overlapping of its fragments. Frequently, the caudal end of the cartilaginous septum becomes dislocated and appears in the nostril as a free cartilaginous ridge covered with mucous membrane.

#### DIAGNOSIS

A history of a blow on the nose, accompanied by a sense of the nose giving away, and associated with nosebleed, ecchymosis about the eyes, pain, and swelling, is presumptive of a nasal injury and fracture.

If seen early, diagnosis may be made at a glance, but later swelling may mask a deformity. Incidentally, care must be taken to avoid mistaking a pre-existing deformity for a recent fracture or injury.

Diagnosis should be made by palpation externally, inspection (both external and internal), and by x-ray. The x-ray film is of utmost importance, since nasal injuries may become a matter of litigation. Plates before and after treatment are advisable.

#### REPAIR OF NASAL INJURIES

The reduction of nasal fractures can be accomplished under either local or general anesthesia. Local anesthesia is obtained by packing the nasal fossa with 10 per cent cocaine with equal parts of adrenalin, or 2



per cent pontocain with adrenalin. Infiltration with monocaine beneath the skin to the infratrochlear and external nasal nerves renders the parts insensible to pain. Intratracheal anesthesia is probably better if a general anesthetic is used.

Injuries of the soft parts usually present no special problem and are treated in a manner similar to wounds elsewhere. The management depends upon the character of the wound, the likelihood of contamination, and the time elapsed since the injury. The control of hemorrhage is the first consideration. This can usually be accomplished by intranasal packing and by pressure externally. Antitetanic serum should be given if there is any doubt as to soil contamination.

Following hemostasis the skin wound is thoroughly cleansed with soap and water. Naturally any foreign body, such as dirt, should be removed. Bony fragments should not be removed, as they seldom undergo sequestration due to the good blood supply of the nose. Displaced or even detached soft tissues should be carefully cleansed, returned to their normal location, and sutured in place. In cases of through and through wounds opening into the nasal cavity, the mucous membrane and perichondrium require separate approximation.

In cases of injury to the hard parts, the displaced fragments should be restored to their normal relations as soon as possible. However, if the patient does not come under observation until marked edema and ecchymosis have already occurred, it is advisable to wait three to four days for the swelling to subside. Cold compresses often hasten the process. In no event, if good results are expected, should reduction of the fractured bones be delayed for more than a week, since after this period preliminary ossification will have taken place.

If the nasal pyramid is displaced to one side and the fragments are not impacted, the nose can be forced into midline by direct pressure with a gauze-covered thumb on the convex side. However, if there is an impaction, it must be forcibly released before reduction can be accomplished. A very

good instrument for this is the Walsham forceps. It is made so that only the tips meet. It is possible to use other forceps, such as the Kelly. Be sure they are well padded so as to prevent any damage to the soft parts.

Depressed fractures may be elevated by placing a blunt instrument into the nostril beneath the displaced fragment. Externally the hand should help guide the nasal bone to its normal position.

If the nasal arch is merely spread it may be elevated and the bones repositioned by direct pressure with gauze-covered thumbs on both sides of the nose.

Comminuted fractures require reduction of each fragment. This is accomplished by instrumentation internally and gentle digital pressure externally.

The nasal bones are not subject to muscular displacement when fractured, and after reduction remain in position unless comminuted. Theoretically, no packing or splinting is required, but practically it should be done for at least forty-eight hours. In the case of comminuted fractures, immobilization should be both internal and external. In some cases it will be found necessary to pass a through-and-through mattress suture of fine wire or silkworm gut through the whole thickness of the nose to reduce the spread of the nasal bridge. Many mechanical splints have been invented, but only in the very unusual and rare case need they be used.

The repair of the cartilaginous structures and nasal septum is by far the most neglected part of nasal injuries. As stated before, the septum may be dislocated, either along the floor or caudally; it may have a fracture (simple, comminuted or compound).

The septum should be put back in its normal physiological position. Frequently this is possible using the Walsham type forceps, but there are cases in which it cannot be properly reduced. In these cases where we cannot put the septum in its normal position, a reconstruction of the nasal septum should be done at once, unless there

are such contraindications as shock or danger to life from other causes.

If the septum is neglected we find that not only will the patient be unable to breathe satisfactorily, but that we have a greater difficulty in keeping the reduced nasal bones in their proper alignment. Therefore, it is necessary to put all parts in their respective normal position if we hope to get a physiologically normal nose. The same principle applies to old unreduced nasal fractures.

In recent years much has been written about surgery of this type of case under the name of rhinoplasty. This does not mean cosmetic surgery, but most frequently refers to the reduction of an old fracture of the nose and/or septum.

Fomon has taught us that the complete septum can be removed, and that by replacing it, or parts of it, between the septal flaps we minimize the danger of a sagging dorsum. Freer expressed this same view in 1902. With the new concept of the septum we now feel safe in doing a combined rhinoplasty and septum operation (preferably a reconstruction of the nasal septum).



Fig. 2. Hump removed. Nose shortened.

The reconstruction operation used by the author was described by Cottle. It has been my experience that one can do a conservative or extensive submucous resection of the nasal septum with the following assurances:

1. Minimal injury to the mucosa—most frequently none at all.



Fig. 3. Septum reconstructed. Nose shortened. Graft put in dorsum.



Fig. 4. Combined reconstruction of septum and rhinoplasty. Basal view shows obstructing septum.

2. Bone and cartilage may be replaced and the rigidity of the septum restored with ease.





Fig. 5. Old football injury. Bony parts shifted to left. Tip narrowed. Patient had septum operation previous to this injury.



Fig. 6. Combined hump removal and reconstruction of nasal septum. Basal view shows obstructing septum.

3. Sagging of the cartilaginous vault may be prevented, and even corrected if present.

4. Wide and ample exposure may be used making assistance available.

5. This operation can be used in both recent or old injuries with equal success.

6. It can be used in combination with rhinoplasty or rhinoplastic procedures.

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#### DISCUSSION

Dr. F. E. LeJeune (New Orleans): I not only enjoyed hearing Dr. Riggs' presentation, but I am most happy to see that a rhinologist is now doing rhinoplasties instead of referring them to the plastic surgeon, as we have done in the past. Through the teaching of Dr. Fomon and his group, fundamental nasal surgery will encourage more and more rhinologists to do this type of work where it really belongs. Much work is being taken from us by the tremendous development in medicine, and I think we ought to prepare young men to do rhinoplastic surgery such as Dr. Riggs has outlined. Besides this, a rhinologist is in a better position to appreciate the physiological function of the nasal membranes and, therefore, respects them greatly. Dr. Riggs is to be complimented for doing this very nice type of work.

Dr. Frank L. Bryant (Shreveport): I'd like to add that the septum operation and the rhinoplasty can be done at one procedure. Some men feel that the septum procedure should be done first and the straightening of the nose should be a later procedure. I think under competent hands both of these conditions can be and should be combined. It is much easier on the patient and gives a better postoperative result.

Dr. Hartwig M. Adler (New Orleans): I'd like to ask what do you do to the comminuted fractures, because of the need of support? How do you support it?

Dr. Riggs: Dr. Adler, in answer to your question about support: I may get in trouble doing it sometime, but in comminuted fractures of the bone over the septum, we think we can treat in splints, the same splints as in rhinoplasty and the use of adhesive.

Dr. Adler: You make your mold for that particular case?

Dr. Riggs: That's right; we have our hot water and make the mold and shape it to the nose.

Dr. Adler: You put a kind of butterfly effect?

Dr. Riggs: That is what they were doing when

I was up there two years ago. They are not doing as much of that now. Now they are placing the stent down to just below the junction of the upper lateral cartilages and nasal bone and not having it all the way on the cheek. It is left on for about one week.

Dr. Adler: During my first year of residency, when I was taking accident room calls every third day, I got to treat a number of broken noses. I tried to splint them with plaster of Paris, but it wasn't until a woman artist from the French Quarter, who happened to come in as a patient, and, who knew how to handle plaster of Paris, showed me how to use plaster of Paris that I was successful in making a satisfactory nasal splint with it.

Dr. Riggs: The one used by Dr. Fomon is made in England and most of the surgical supply houses are stocking it.

Dr. L. W. Alexander (New Orleans): I would like to say that all of the plastic procedures of that type should be done by the otorhinolaryngologist, as was brought out. It is most important. Most of the plastic surgeons who have operated on some of my patients have absolutely no regard for the physiology of the nose. I think that is the important thing in this paper.

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## BRONCHIAL ASTHMA IN CHILDHOOD\*

J. DUDLEY YOU MAN, M. D.

SHREVEPORT

Generally speaking, we see two types of asthma in children. The typically allergic type, with positive skin tests that are of clinical significance, in which the symptoms and treatment follow that of extrinsic asthma in the adult, we do not see many cases that fall into this classification. The other type, which makes up by far the bulk of the young asthmatics seen by us, is best classified as mixed allergic and infective. These cases have usually been under the care of the pediatrician or general practitioner and have been diagnosed as asthmatic bronchitis.

I am particularly interested in this latter group of young asthmatics, because I think their problem is not completely understood, and I believe with proper treatment much can be done to alleviate their immediate trouble and prevent or lessen trouble in later life.

These children often have a history of allergy in infancy in the form of excessive spitting of food, much colic, unexplained diarrhea, and intolerance to certain foods. These symptoms have brought about frequent changes in the child's formula. Finally, at about three months of age, they begin to straighten out more or less spontaneously. They may or may not give a history of infantile eczema. There is a positive family history of allergy in a high percentage of these cases.

At two to four years of age, blockage of the nose is noticed, with a watery discharge which changes to mucopus with colds. The secretion may be profuse or scanty. Short bouts of sneezing occur in some, but it is not a dominant symptom. They are mouth breathers and they snort, snore, and make noises when sleeping. They rub and pick at the nose. They are usually worse in the morning and at night, clearing partly to completely in several hours after arising. They can almost predict the weather as they get worse as the humidity increases and with a sudden change in temperature, particularly a sudden change to a cold damp day.

They do very well in the summer but have trouble in the spring when the weather and temperature are so changeable, and to a little less extent when winter finally sets in.

As time passes they get worse with each fall, winter, and spring, and from then on, or by the time they reach preschool age and the first few years in school, the mother complains of an accentuation of nasal symptoms with the development of one cold after another which goes from the nose, whose secretions at that time take on characteristics of a cold, to the chest, with a low grade fever that may go to 103° to 104°F. They develop a cough, wheezing and difficult breathing which is asthmatic in type with numerous moist and musical rales over the chest in the next twelve to forty-eight hours.

Epinephrine will improve the asthmatic breathing somewhat for a short time, but will not give nearly as complete and prompt

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relief as in the child with extrinsic asthma.

In a few days to a week, they gradually improve, returning to the stage of perennial rhinitis. One, two, or three weeks later there is a recurrence of the asthmatic bronchitis, and so it goes, resulting in the child being able to attend school only about half the time. They feel badly, lose weight, are peopless, cross and listless, or have an excessive amount of nervous energy with easy fatigue. The appetite is poor, they are usually anemic, and between the acute spells many have a brassy cough which drives the parents frantic because of the constancy and frequency of the loud rasping sound throughout the day and night.

The blood count varies with the stage in which it is taken. Usually there is a leukocytosis, and no eosinophiles or a slight increase in the eosinophiles during the acute stage, and a normal total white count with an increase in eosinophiles of from 4 to 15 per cent between attacks. The nasal secretions usually show an eosinophilia between attacks to become purulent during the acute phase.

The type of skin tests done (passive, transfer, scratch, or intradermal, depending upon the age and cooperation of the child), is often disappointingly negative. The detailed history is much more valuable than the skin tests in getting food and inhalant leads which prove to be clinically significant.

Because of the lack of positive food tests, elimination of individual foods is tried, and if not successful, the child is put on elimination diets for short periods of time. At times, we find a few foods that are causing trouble but very often no foods can be incriminated at all. Such clinical trial food testing in these individuals is difficult because frequent secondary infections, weather and temperature changes make conclusions hard to reach, and many suspicious foods, on repeated elimination and trial, prove to be nonallergic in nature.

The inhalant tests are more revealing and many of these children are house dust sensitive, although there is a significant group who give negative tests to scratch Endo

dust. Many are sensitive to feathers and some to animal danders, pollens, mold, and other environmental allergens. A few are negative all the way through.

It is my opinion that these cases represent a perennial rhinitis with subclinical allergic asthma. Secondary catarrhal infection recurrently occurs in a fertile field,—the partially blocked nose,—with resulting acute sinusitis and bronchitis which is enough to make the asthma clinically manifest. As the infection clears, the allergic balance is re-established and the asthma disappears, except, very often, for the troublesome cough which persists for a shorter or longer time. The patient returns to his uncomplicated perennial rhinitis again to repeat the same cycle in a few weeks.

Before they come in for allergic survey, all of these patients have been under treatment for months or years without the desired results. They have had the infection treated at each acute episode, and the allergy has been ignored. To get results, it is essential to treat the allergy and at the same time do as much in a prophylactic manner to prevent respiratory infections as our knowledge now permits. When the extrinsic allergens have been removed, many of the children can have colds without asthma and the colds are usually milder. But it is just as important to try to prevent respiratory infections as it is to get the allergy in hand if best results are to be obtained.

In treatment, full instructions are given for the strict and as nearly complete as possible elimination of the suspected environmental allergens. Hyposensitization is carried out with the positive inhalant reactors and all patients are given a stock vaccine.

In addition, chilling is to be avoided and the room temperature is kept at 70° F. at night with ventilation from an adjoining room. These children should be properly dressed to avoid exposure and protect them from the weather.

Small doses of sulfadiazine or sulfathiazole, or penicillin, are given daily through-

out the bad months, and with the onset of an acute attack the doses are increased and penicillin by inhalation or by injection is given, if needed. At times, the respiratory infection can thus be aborted, and nearly always made much milder.

The question is frequently asked if the use of penicillin in this way will not cause penicillin resistance. I have not found it to occur. Fink,<sup>1</sup> who has used a great deal of penicillin over long periods of time to prevent chronic bronchitis and bronchiectasis found none of his cases become penicillin resistant.

At Bowen's<sup>2</sup> suggestion, gamma globulin in 4 to 6 cc. doses every six weeks, subcutaneously, with 1/20 cc., intradermally, given once weekly is being used to control respiratory infection. We have not used it long enough to have an opinion as to its value.

Any food to which the child is found allergic is eliminated, but since we find food does not cause much trouble in this type of asthma, our patients are always on good well rounded diets. We believe this is one of the essential parts of treatment, because most of these children are thin, listless and anemic, and we have found that they improve better when properly fed than on greatly restricted diets. For that reason, we usually get the inhalant and infectious angle in hand first and get the general health of the child improved before too strict a dietary regime is tried. Then, the trial elimination diets are limited to short periods of a week or ten days.

The further I study these cases, the more I agree with Hill<sup>3</sup> who says, "That food can cause asthma in children is a fact beyond dispute. The frequency of this sensitivity as well as its relative importance to recurrent respiratory infection, sensitization to pollens and other environmental allergens is an entirely different question, concerning which there is considerable difference of opinion." In his series of 100 asthmatic children in whom he was trying to evaluate the importance of foods as a cause of the asthma, 20 per cent of his positive food tests were clinically significant, 8 per cent

of his positives were caused by other allergies unrelated to the asthma, and 72 per cent of the positive food skin tests were of no present clinical significance.

An iron and vitamin tonic that contains amino acids is also used as well as the anti-histaminics for the nose. Anti-asthmatic drugs, such as epinephrine, aminophyllin, theoglycinat, and ephedrine, are used as indicated. Syrup of ipecac has been used by Ratner,<sup>4</sup> Glaser,<sup>5</sup> and others in childhood asthma and they find it very efficacious, especially in those who fail to respond to epinephrine. The vomiting and retching, according to Ratner, produces a reverse peristalsis in the bronchi and trachea and the tenacious mucus plugs, and thick mucus are literally "vomited" from the respiratory tree, giving relief when other drugs fail.

We try to make the regime as simple as possible, and in this way, get better cooperation from the children and parents. When the child improves, we try to get him to live as nearly a normal life as possible. Overrestricting can easily make hypochondriacs of these youngsters. I feel as Pratt<sup>6</sup> does that "I would rather see the child with an occasional mild asthmatic attack than the same child free from asthma but a pampered invalid. Except in asthma of extreme severity, overprotection must be carefully avoided."

Tonsillectomy is contraindicated<sup>6-8</sup> in the treatment of asthma. If the usual indications for the removal of tonsils and adenoids are present, the operation should, of course, be done. Asthma is definitely not one of the indications.

Fink<sup>1</sup> finds it to be the rule rather than the exception to find chronic bronchitis of more or less severe character in one or more relatives of children affected with recurrent attacks of tracheo-bronchitis and pneumonia. He found this to be the initiator of chronic pulmonary disease in children under two years of age in at least 70 per cent of the cases. Attempts are made to clear such infections or protect these children from them and they are kept away from persons with acute respiratory infections. This is extremely difficult to do with



children going to school, so it is our job to make them able to withstand these exposures better than previously.

The prognosis is good in these cases over the long pull when both the allergy and infection are treated concomitantly. Treatment of the allergy cuts down on the number and severity of the infections, and constant prophylactic measures against infection add to the results. However, as Urbach<sup>9</sup> states, the prognosis has not been thoroughly evaluated. He cites Brock's study of 350 cases. Brock noted a tendency of childhood asthma to improve after the age of ten years with spontaneous recovery at the time of puberty in about one-third of his cases and improvement in a total of 80 per cent. However, in commenting on Brock's statement, Urbach<sup>9</sup> feels that more prolonged observations would reveal a recurrence of the same or other allergic states. In our present state of knowledge when so much can be done for these youngsters, I believe it is a foolish, outmoded, and hazardous attitude to take, that these children will outgrow their asthma. Even if they do, such an attitude inflicts on these children years of relative invalidism, which are unnecessary and unfair to the child. It will, also, leave a certain percentage with irreversible permanent changes in their nose and lungs which they will have trouble from throughout the rest of their lives.

Hurst quoted in Urbach's<sup>9</sup> book gives us a note of optimism. To quote Hurst: "every asthmatic can derive much benefit from good advice. He can be taught a way of life: how to avoid the exciting cause of his particular brand of asthma, and above all, how to be happy in spite of the bad luck of having been born with the asthma diathesis."

We usually tell the parents that we rarely can give them an entirely symptom free child, but that the child will have fewer and much milder attacks; that his general health and disposition will improve; he will gain weight, have vigor and will not tire so easily; and that the appetite will improve. Also, that they will soon begin to live and play, with average precautions,

like any normal child with a minimal amount of trouble. They are also told not to expect miracles, that results take time, weeks, and months, and that for maximum permanent relief regular treatment must be continued, often for several years.

One gets a great satisfaction out of treatment of these patients when one sees the child bloom forth after a few months of treatment. The parents, after long months of worry, begin to live normally again as the child improves and are very appreciative, even at times with results that the allergist would not consider the best. The child is better, and the mother and father are grateful.

#### SUMMARY AND CONCLUSIONS

Asthma of the mixed allergic and infective type, often called asthmatic bronchitis, is discussed. These children seem to have one cold after another in the fall, winter, and spring with recurrent attacks of asthma. There is usually a history of previous other allergic diseases in the child and a high percentage give a family history of allergy.

Their response to antiasthmatic drugs is partial, incomplete, and temporary, contrary to what is found in uncomplicated extrinsic asthma.

The skin tests are important, especially from the point of view of inhalants. Some foods, usually very few, can be shown by strict clinical trial to be of etiologic significance, and this is fortunate as it is essential that these children have a good well balanced diet.

It is our opinion that these cases represent a perennial rhinitis with subclinical allergic asthma. Secondary catarrhal infection recurrently occurs in a fertile field, the partially blocked nose, with resulting acute sinusitis and bronchitis which is sufficient to make the asthma clinically manifest. As the infection clears, the allergic balance is re-established and the asthma disappears. Again, the perennial rhinitis becomes manifest. This cycle repeats itself every few weeks throughout the fall, winter, and spring making these children almost semi-invalids.

The cause for failure in treatment is that only the infection or only the allergy has been treated. Best results are obtained when the allergic angle is gotten under control, and at the same time, constant measures are used prophylactically against respiratory infections. Each acute respiratory infection should be treated vigorously in an attempt to either abort it or lessen its severity.

The prognosis is usually good. The parents are told to expect no miracles; that the results take time, weeks, and months; and that for maximum permanent relief regular treatment must be continued often for several years.

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#### DISCUSSION

Dr. N. K. Edrington (New Orleans): I believe that the average allergist in the management of the allergic child, has a tendency to place too much importance on the restriction of the child's activities. Sports, such as swimming, baseball, etc., should be encouraged in moderation. The child should not be made to feel that he is abnormal, as this creates in his mind a psychological state which does more harm than good.

I have in mind one of my patients who has suffered from bronchial asthma since childhood. He is now a big strapping fellow about six feet tall and weighs about 195 pounds and is a picture of health. He is an only son of a mother who pampers him a great deal and her attitude has created in this boy's mind the belief that he is, as the result of his allergy, below par in health and different than his associates. Since childhood his mother has impressed him with the importance of living a quiet and restricted life. For many years he has consulted and been under treatment by many allergists with very little change in his symptoms. Recently he enlisted in the U. S. Army Reserve Corps and has joined the New Orleans Athletic Club where he daily takes part in various

strenuous exercises including weight lifting. None of these activities has increased his symptoms. If anything, he seems to be better; however almost every day on returning home in the evening and anticipating the questioning by his mother as to his whereabouts and activities during the day he has mild attacks of asthma.

Dr. Narcisse Thiberge (New Orleans): I think Dr. Edrington has brought out two good points about the psychic element and about the liver function. I think the antibodies are pretty well developed in the normal function of the liver and if the liver isn't functioning adequately, we don't get any result.

The next point, which I should have said first, is that Dr. Youman ought to be complimented on the work he has done. I have known Dr. Youman for a long time and I know he has had some personal interest in allergy and consequently has perfected himself on that subject. He has done excellent work and given an excellent paper.

I want to emphasize the gastrointestinal allergy part. We overlook both this and the liver function. I get very good results from a combination of ammonium chloride and ephedrine and sometimes I add a little barbiturate. I don't bother the children with too many injections. I have them report at long intervals. I am satisfied with the results.

I have been doing this work in allergy since 1916 and am able to follow cases over a long period and consequently give a good summary of the cases I have followed through. The enthusiasm for a good many of the new drugs comes and goes, and I have come to this conclusion about the antihistaminic drugs. It's not so much the drug you use, it's the dose you use and the personal enthusiasm you throw into the work that brings the result.

We have the normal cycle of allergic diseases: eczema in childhood, asthma in adolescence, hay fever in the adult, and then the terminal stage is asthma.

Another thing I use for the children is a little respirator, fashioned like the benzedrine inhaler, for penicillin. Good results are obtained from the penicillin. Penicillin, I think, has some effect upon the allergic processes. One precaution must be observed in using the inhaler. If the child blows back into the inhaler the moisture from the breath will clog the penicillin. This is shown by good results at the first application which are not maintained because moisture has been introduced into the apparatus. It's just a little portable thing that the children carry around and they can be taught to use it at an early age.

Another thing too, psychic or not, I think it goes in line with Dr. Edrington's experience about sending his patient to the bowling alley, I had a child who had asthma and the only cure was for the father to put the child in his auto and ride him



around the city. Whether it was the change or something else, the spell was broken.

Dr. H. G. Ogden (New Orleans): The saying goes among pediatricians that you have to treat the mother as well as the child. There's the mother with only one child who will come to the office and magnify the symptoms and that child is going to have an emotional factor. They get a little pampered and I think in evaluating the symptoms, we have to take those things into consideration.

Another point is that people and even doctors say the child will outgrow the asthma. I treated a woman seventy-seven years old, waiting all her life to outgrow her asthma. She was allergic to house dust.

The American Academy of Allergy is going to come out with some press releases which are being worked on now. They will try to explain some of the misconceptions to the public and this will be given to the Associated Press, and the United Press, because these fallacies are very injurious to the practice of allergy.

Dr. Sam Zurick (New Orleans): I enjoyed your paper very much, Dr. Youman, and I feel like an illegitimate offspring at a family gathering in commenting thus. I take a contrary point of view to one of your statements, namely the contra advisability of tonsillectomy in asthmatic bronchitis. I think most of those individuals have asthmatic bronchitis as a result of an infection. I feel the focus of infection is quite frequently in the nose and nasopharynx. One of the primary functions in relief of asthmatic bronchitis is in the removal of the adenoids. The tonsils also act as a primary focus of infection, but I believe the adenoids are most important since they receive the drainage of the nose and sinus, and should be removed in case of asthmatic bronchitis. One more occasion of that is your statement that you do use a stock vaccine.

Dr. Youman (In conclusion): I want to thank the discussors for their kindnesses to me.

Dr. Zurick, I think it was my idea that tonsillectomy should not be done for asthma. If you have infection in the tonsils and adenoids I think they ought to come out but it has been my impression and also of Moore, Stouser and Pratt that some of the children after the tonsils have been removed, begin with or have worse asthma. Many of the children who have the tonsils and the adenoids removed and the allergy not gotten in hand, have a regrowth of the adenoid tissue in the nasopharynx and tonsillar region.

As far as penicillin sensitivity, I haven't seen any in the children I have had on penicillin. I have seen lots of penicillin sensitivity because I do both dermatology and allergy. Most of the penicillin sensitivity has been in adults. I have seen very little in children.

Dr. Ogden brings up the use of radium and x-ray

in these individuals. I would rather have him talk on that. I have used it some, but not enough to be able to express an opinion on it. I have used it on cases where there's some deafness from the blockage of the eustachian tube with gratifying results. However, sometimes, after years have passed, the trouble has recurred.

Dr. Ogden: I might say one word about radium and x-ray. You know Dr. Gay and some of the group worked on it. I heard Victor Cohen in his talk on the use of radium in asthmatic children and he found that a large percentage had temporary relief of asthma.

I talked to Dr. Cohen and he is working on x-ray treatment for this type of child and there's a particular method of giving x-ray worked out in Buffalo. If you are interested I have the name of the technic and I have his methods. I haven't used it, but if you are interested I will be glad to give it to you.

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## THE SHORTAGE OF RURAL DOCTORS

### A CONSIDERATION OF CAUSE AND CURE\*

J. P. SANDERS, M. D.\*\*

SHREVEPORT

In short, the cause of the scarcity of doctors in the rural areas may be laid to three factors: overspecialization, rapid transportation, and lack of local interest.

#### OVERSPECIALIZATION

We are living in an age of specialists. On almost every side we see businesses, trades, professions, and all kinds of human enterprises, carried on more or less according to some specialty regime. An automobile mechanic is not a general mechanic, but is a specialist on carburetors, on motors, on electrical systems, or is a body man. Stores deal in special types of foods or clothing. This tendency all over the country is so pronounced that we more or less accept it, and it is probably a good thing.

Medicine is no exception to this rule. For the past twenty-five years there has been a definite tendency for medical schools to stress specialization to their stu-

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\*\*President of the Louisiana Rural Health Council.

dents. Medicine is taught as a specialty rather than as an integrated whole. The teachers themselves are practically all specialists. There are only two or three schools in the country that have a department of general practice. Some of the schools go so far as to eliminate general practice and general practitioners from their hospital staffs entirely. My own alma mater, the University of Texas, does not have a general practitioner on its staff. The teaching hospital, John Sealey Hospital, is closed to all general practitioners.

Other hospitals are concentrating on training specialists. Residencies are offered in surgery, pediatrics, obstetrics and gynecology, and particular efforts are made to get these recognized by the American Specialty Boards. A situation has developed in which the student, from the time he enters medical school until he finishes his postgraduate training, is filled with the theory that specialization is the only thing to do. Some of the teachers go so far as to tell their students that general practice is a thing of the past and there will not be a place for a general practitioner in the near future.

Another factor that has influenced overspecialization has been that of income. In the year of 1947 (obviously a very good year) the general practitioners over the country averaged \$9,300, the part-time specialists received \$11,200 per year, while the full-time specialists had an income of about \$14,500. Thus the specialists made \$5,000, which was a 50 per cent greater income than the general practitioner. On the whole his hours were shorter, his practice more regular, and in general, the specialist was better off. He had more time for reading, more time for postgraduate study and a larger amount of time to spend with his family and for recreation.

As medicine advanced the effort to keep up with medical progress became more and more difficult because each specialty made such rapid strides; new journals were developed; the number of drugs increased and there was an increased usage of these drugs; new technics for diagnosis and

treatment were developed. Consequently, the general practitioners found it almost impossible to keep up in all branches of medicine, but found it simpler to keep up in only one field, and there again was the tendency to specialize.

Then, the patients themselves began to demand specialists' care. This was true whether or not the specialist was needed, whether or not the patient could pay, or whether or not the specialist was available. I have had patients who never paid one dime for medical care, but insisted on a specialist being called in for almost any kind of disease.

Patients who could afford it frequently left their own family doctors, who were perfectly able to take care of them, and went to large named clinics, which, of course, increased the cost of medical care. They not only had the expense of the high priced clinic, but the cost of transportation, hotel bills, and other expenses. This situation still exists. Patients still search out doctors with big names. They pass by their local physicians, who in most cases are clearly capable of taking care of their illnesses. They go to the specialist either in the nearby, or in the far away urban center because of the big name. They use the home doctor or the family physician for simple emergencies and for night calls. In other words, the patients themselves by their own acts, made the general practitioner the "whipping boy" of medicine. He may be just as well trained, and in many cases much more competent. But, because of his nature and temperament, he decides to stay in general practice rather than to specialize, and he is made the "goat" of medicine. Thus the patients in general forced many good general practitioners to enter the specialty fields and thereby increased the cost of medical care. All of us have heard patients at one time or another brag about the big fees they paid at some big named clinic and almost in the same breath, gripe about the high cost of medical care.

#### RAPID TRANSPORTATION

Good roads all over the country at the present time make the patient closer to the



doctor than ever before. The patient who lives twenty miles away is now closer to the doctor than the patient who lived three miles away in the old "horse and buggy" days. Good automobiles not only make quicker transportation for the patient, but make it easier and safer even over long distances. Almost any car can be converted into a bed of some sort for a sick patient. Ambulances go many miles to bring in sick patients to medical centers. Even a truck can be made into a bed that is more comfortable than the old wagon or buggy.

Many small towns and communities that formerly had one, two, or three doctors have no need for even one doctor at the present time. The ease of transportation makes it much more desirable to transfer the patient to the doctor's office, or clinic, or even carry him to a hospital.

Because of better transportation, certain other facilities developed for the better care of the patient: A concentration of physical equipment in the form of buildings, laboratory, x-ray and other equipment for the better diagnosis of disease; a concentration of nurses, technicians and other allied medical help in these centers; a concentration of medical personnel. Doctors find they can more properly care for their patients when working in association with other doctors. They can combine their financial and educational resources for the better care of the patient. Naturally, the patient who gets the advantage of this increased medical care makes a speedier recovery and is more ready to go back to his job.

People are now only a few hours from any medical center in the country. Through rapid railroad and plane transportation the patient can be carried all the way across the country in less than a day's time. Kitchen table operations are no longer necessary. Blood, plasma, glucose, and many other of the present day essentials of medicine, are available practically on every street corner. Rare and expensive drugs can be had in a few hours from anywhere in the United States. If a patient can live long enough for any treatment to

do him any good, he can be transported to that place, or that treatment can be transported to him without endangering his life to any extent. Thus transportation itself contributes as much to good medical care as any other thing. Without it many people would die that will now live. This, within itself, makes dispersal of doctors in many cases unnecessary.

#### LACK OF LOCAL INTEREST

Many communities never consider their doctors as community assets. They consider their churches, schools, banks, stores, and many other items that are a part of the community as assets, but they consider the doctor as just another citizen. They do not consider him of sufficient importance to be interested in whether he succeeds or not. They are perfectly willing to pass him by and go into the city for their medical care. If they use him in emergencies or at night, many of them consider it unnecessary to pay his bills. If they do pay them, it is done very reluctantly and they usually "gripe" about it. In general, the rural doctor who is a financial success is looked upon with a considerable amount of distrust, envy, and in some cases, downright jealousy.

Many rural communities never consider it necessary to supply the doctor with the buildings, equipment, and personnel that are necessary to run a good clinic. A good clinic with good equipment is always a community asset. I believe the opinion has developed all over the country that this must be supplied by the community itself, if the location is going to attract and hold a good physician. If such a clinic is built by the community, equipped by the community, and allied personnel supplied locally, then a qualified physician can always be obtained to run it. If he is not satisfactory, then of course he can always be discharged and someone else obtained.

The clinic can be either leased to the physician or donated, whichever the community considers best. Home nurses and home technicians, if properly trained, are always more valuable and easier to hold than ones who have to be imported from outside. A public spirited community will

find it necessary to send one or two of their own high school graduates away to study nursing or take a course in x-ray and laboratory technics. It may be profitable to send another one away for a business course. If the community takes the proper interest in itself, and works cooperatively, it can solve its own medical care.

In order to do this there must be developed a community interest and spirit similar to that which is commonly shown in schools. Your community must be interested in having as good medical care and as good health as a neighboring community. You must take a personal interest in your doctor and above all when you have him there, you must use him.

#### HOW WE CAN SOLVE THE DOCTOR PROBLEM

In order to solve the rural health problems, it is oftentimes necessary to make a survey to see whether or not the community needs or can support a physician. Obviously, if there are not enough people in that community and its immediate surrounding territory, financially able to support a physician, it is foolish to try to get one in. If the community is too close to a well established medical center or clinic, it may be folly to try to get one.

The next step, after the survey is made, is to provide the physical facilities. These are necessary for good medical care. A building of sufficient size must be provided either by new construction or renovation of an old building. A community should not want to put a doctor and his personnel in a shabby, rundown building of which everybody in the community would be ashamed. We see this done sometimes with our Public Health Units and it should certainly be avoided when we are preparing for our doctors.

Then the building must be properly equipped. There are certain minimum requirements that must be met. These, of course, include reception room chairs, examination tables, an x-ray of some kind, and some laboratory equipment. Most doctors will want an electrocardiograph, diathermy, ultra-violet light and also diagnostic aids. If the doctor is to give good

medical care to that community, then these facilities are just as important as the stethoscope, the thermometer, and the blood pressure apparatus.

The average young doctor is not able to buy and install this expensive equipment on the possibility that he can pay for it out of his income. The community knows that it needs it; that if one doctor does not use it, another will. But the equipment must be provided. These things should be kept up by the doctor in charge and replaced by him when they are worn out. There are many little items that the doctor himself will want to buy that are easily replaced, and are more or less inexpensive and these, of course, will be his own personal property, but the main plant and equipment should belong to the community. When such a physical plant is provided, it is much easier to get a well trained general practitioner to come to the community than it would be otherwise. Generally, he will stay.

In many communities a small hospital is advisable, or it may be considered necessary to put hospital beds in the clinic recommended above. These hospital beds may be used for only daytime service or it may be advisable to keep patients overnight, particularly emergency cases and those for delivery. If the community is large enough, then, of course, a small hospital may be provided on a nonprofit basis. If this is done, Federal funds are available under the Hill-Burton Act (Public Law 725). This will take care of one-third of the building costs. The maintenance will have to be by the community.

As mentioned above, local well trained personnel (for clinic or hospital) are usually much more satisfactory than imported personnel. A girl who is born and reared in a community and has had nurses' training is much more likely to come back to that community than one who has been brought in from outside. The same is true for technicians, stenographers, bookkeepers, maids, or any other allied personnel.

Then the community, after it is organized, can ask its medical schools and hospitals to train more good general practi-



tioners. No community wants any kind of poorly trained medical man. Many doctors are educated at enormous taxpayers' expense. Obviously, many of the doctors recognize that they owe the state and community a considerable obligation, and are willing to donate large amounts of their time to the medical indigent.

Although most communities cannot afford several specialists, they can afford one good general practitioner. But this general practitioner must be well trained. He must be capable of doing 85 to 95 per cent of the community work, and he must be able to do it well. We want him not only to be able to deliver a baby, but to take care of croup, treat a coronary occlusion, and in many cases, remove tonsils, or do an appendectomy. The latter, of course, should only be done where there are hospital facilities available and he must be trained for doing that type of surgery.

As a community you can persuade your doctor to attend medical conventions and take postgraduate courses. This makes him a better doctor. Thereby, he keeps up with current advances. Do not expect your doctor to stay on the job seven days a week, three hundred and sixty-five days a year. Every time he takes out a week for any kind of postgraduate training, he comes back just a little better doctor.

Then, he should become a member of the American Academy of General Practice. The Academy expects to take in the best general practitioners. We are going to insist on each member's keeping up his postgraduate training. At least one hundred and fifty hours of postgraduate work will have to be done every three years, in order to stay in the organization. The Academy wants the general practitioners to be the best trained men in medicine. We realize that the specialist is a little better trained in his own specialty. But the general practitioner knows so many more things about the human body as a whole that he never loses sight of any part of it in carrying on good medical care. Through the Academy we expect to raise the standards of the gen-

eral practitioner and the prestige that he so justly deserves.

In conclusion, I want to insist that you use your doctor when you have him. Make him your family physician; always consult him first for any and every illness. By far and large he will be able to take care of your needs and usually at a cheaper cost, but if a specialist is needed, let your family physician be the one to select the consultant. We need consultants. We have to have them. We want them well trained. *But the well trained general practitioner will know when and whom to consult.*

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## POSTMENOPAUSAL BLEEDING FROM BENIGN UTERINE LESIONS\*

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It is with some trepidation that attention is called to the *benign* lesions which produce postmenopausal bleeding. For years every teacher of gynecology has constantly repeated the trite, but none the less true, medical aphorism that "all postmenopausal bleeding is due to malignancy until proven otherwise." The following remarks and observations must in no way detract from this fact. At the present time the diagnosis and treatment of uterine carcinoma, both cervical and endometrial, are widely discussed within our limited knowledge of such diseases. But there is a distinct hiatus in our knowledge of the postmenopausal bleeding which has been "proven otherwise." It is the purpose of this paper to present and discuss not only the etiological factors but also rational methods of therapy. The discussion will be limited to benign uterine lesions with full knowledge

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that many vulvar and vaginal lesions, benign as well as malignant, produce postmenopausal bleeding which must be differentiated from uterine bleeding. Fortunately, direct inspection supplemented by biopsy permits a simple and efficient differential diagnosis of most such lesions.

Postmenopausal bleeding may be defined as any bleeding from the generative tract which occurs at least one year after the cessation of menses. Some gynecologists place the time limit at two years rather than one. This time factor is of no great clinical importance, but the bleeding is of greatest importance.

Admittedly, we do not know the frequency of postmenopausal bleeding in the general feminine population, but this is no doubt greater than studies have indicated, as many women never bring such problem to their physicians. We know that the incidence of benign postmenopausal bleeding is increasing. This does not imply that uterine cancer is less common, on the contrary, it too is increasing in frequency. Cheek and Davis<sup>1</sup> reviewed the literature concerning incidence, and substantiated the widespread clinical notion that about half of all postmenopausal bleeding is due to malignancy. The incidence in various American clinics varied from 53 to 81 per cent. At least this was true from 1930 until 1941. However, their recent survey<sup>1</sup> at the Johns Hopkins Hospital indicated that now only 36.1 per cent of postmenopausal bleeding is produced by malignancies. The cause for this proportional change is not known. Some of it may be due to prompt reporting by the patient of all bits of bleeding and some is undoubtedly due to the widespread clinical notion that about half experience confirms this belief. Whatever the cause may be, a greater proportion of observed patients have benign uterine bleeding than was the case ten or fifteen years ago.

Because of confusion in diagnosis of benign uterine bleeding the methods of therapy have often been poorly designed. Some physicians because of a morbid fear of carcinoma, a fear by no means unjustified,

treat most of the patients as though carcinoma were present. That is to say by total hysterectomy with or without preliminary irradiation. Others use the implantation of intrauterine radium indiscriminately. This subjects many patients with benign lesions to the unnecessary discomfort, morbidity, and mortality of major surgery or radium insertion. Far worse, of course, is no treatment or a subtotal hysterectomy as neither treats the malignant nor the benign lesion properly.

#### DIAGNOSTIC METHODS

In addition to the usual historical questioning, it is necessary to emphasize one or two worthy points. First is the intake of estrogens. One of the causes of postmenopausal bleeding is overtreatment with estrogens. They may be found in capsules, pills, pellets, "shots", suppositories, ointments, and even in cosmetics. Secondly, questions should always be directed towards the presence of blood dyscrasias such as "black and blue bruises", and bleeding gums.

If the history is followed by a careful pelvic examination, including speculum examination under good illumination, the diagnosis will be made immediately about half of the time. However only a very few of the patients with abnormal *uterine* bleeding will be diagnosed correctly at this time. Yet it is at this point that patients are too frequently taken directly from the examination table to major surgery or radiation therapy. Vaginal cytological smears may be made at this time as an aid in diagnosis, but it must be clearly understood that at the present stage of our knowledge such smears are not to be considered as finally diagnostic. With few exceptions, to be mentioned later, every patient with postmenopausal bleeding should have a diagnostic curettage and/or biopsy of suspicious cervical lesions.

Before proceeding with other diagnostic methods, it is important to probe the endocervix of all patients past the child-bearing age with a small, blunt, slightly malleable sound. Such a simple procedure may establish the presence of an inverting



carcinoma of the endocervix in the shell of an apparently normal ectocervix. It will also often demonstrate strictures or adhesions of the cervix which are the cause of bleeding.

Many physicians are not obtaining maximum diagnostic information from curettage because they fail to make it a fractional or differential curettage. First the cervical canal is dilated and curetted and the specimen, however small, is always kept separate for the pathologist. Then the uterus is curetted thoroughly in a systematic fashion. The curettings should be caught on a strip of gauze, moistened in saline and squeezed gently to remove excess blood. The purpose of fractional curettage is twofold. First, the concentration of cervical tissue may permit diagnosis of a tiny early cervical carcinoma that might otherwise be lost by dilution with the abundant uterine curettings. Recently, several articles have appeared in the current literature describing various new instruments for obtaining a representative biopsy of the squamous-columnar junction of the cervix. We have used the curet successfully for this purpose for many years. During the past year it has been possible to make a diagnosis of cervical carcinoma on two occasions from the cervical curettings in an otherwise apparently nonmalignant cervix. Second, fractional curettage also assists in distinguishing cervical adenocarcinoma from endometrial adenocarcinoma.

The use of the suction curet or similar tool to obtain samples of endometrium for differential diagnosis of postmenopausal bleeding must be condemned. Such a curet is admirably suited for its intended purpose—the sampling of an endometrium to determine the presence or absence of ovulation. Even a random curettage removes no more than 50 to 75 per cent of the endometrium; although a systematic technic will do much better. How unrepresentative then is the endometrial biopsy!

#### DIAGNOSIS AND TREATMENT

Once malignancy has been excluded the problem is only partly solved. The remainder of this paper will concern the diagnosis

and treatment of the common benign lesions which produce the remainder (over half) of all postmenopausal uterine bleeding.

*Cervical Polyps:* One of the frequent cervical lesions in this age group is the polyp. These bright red, velvety, pedunculated growths have a small pedicle and are quite vascular. As they usually protrude well beyond the cervical os, they are easily removed by snipping the base or twisting the pedicle. Rarely are cervical polyps malignant, but all should be examined histologically. Epidermization about the base of the polyp commonly leads to an erroneous diagnosis of malignancy, yet only a few days ago we did observe a squamous cell carcinoma developing in the base of a polyp. As a group, cervical polyps are generally innocuous and the gynecologist is usually delighted to find one when a patient presents herself with postmenopausal bleeding.

*Cervical Erosion, Cervicitis and Cervical Ulcer:* The diagnosis and treatment of such lesions are so well known that little more needs to be said except to warn again that there must be a biopsy of suspicious lesions to exclude carcinoma. Cervical ulceration and bleeding associated with prolapse are occasionally seen. A biopsy should be taken to exclude malignancy. Treatment consists of bed rest, cervical replacement and palliative local therapy followed by an appropriate vaginal plastic procedure after the ulcer has healed. Adhesions and strictures of the cervix also produce vaginal discharge and bleeding, but usually because of a secondary endometritis rather than from bleeding by the local lesion. This will be discussed later.

The diagnostic possibilities of the benign lesions of the corpus uteri are more numerous and only the more important ones can be considered herein.

*Endometritis:* The surface epithelium of the senile endometrium becomes very flat and thin and at times is apparently absent. Such a mucosa is readily susceptible to infection, and following infection, bleeding. Cervical strictures, adhesions, trauma

and pessaries, and other factors known and unknown may produce a secondary endometritis varying from a mild senile endometritis to a severe pyometra. A diagnostic curettage usually cures. If pyometra is present then curettage should be delayed but never forgotten because of the common association of pyometra and carcinoma.

*Hyperplasia of the Endometrium:* Under the term hyperplasia we shall consider only the uniform generalized hyperplasia of the entire endometrium which is difficult to explain on any basis other than stimulation from endogenous or exogenous estrogens. Furthermore the hyperplasia may be either active or retrogressed.

1. Active Hyperplasia Due to Exogenous Estrogens. It is a bit difficult to understand why patients one or two or more years after the menopause are treated with estrogens. (The local vaginal application of estrogens obviously excluded.) But such is the case and these women often bleed as a result. The proper management of these patients is by no means settled, but as a general rule it is safest for the patient to have diagnostic curettage. It is dangerous to assume that postmenopausal bleeding is benign just because the patient is taking estrogens. We have seen, as no doubt you have seen, endometrial carcinoma in women who were taking estrogens. However if the patient is well known to the physician, and if she can be depended upon to return without fail for check-up examination then nothing more than immediate withdrawal of estrogens is necessary. Any bleeding subsequent to withdrawal of hormones must always be investigated by curettage. The vagaries of carcinoma make it most dangerous to dispense with diagnostic curettage in any woman with postmenopausal bleeding.

2. Active Hyperplasia Due to Endogenous Estrogens. If the hyperplasia can be clearly distinguished as generalized and not localized, as in sessile or pedunculated polyps, the most likely cause is ovarian tumor. Kottmeier<sup>2</sup> believes that 95 per cent will have tumor if a true generalized hyperplasia is present. This is at some vari-

ance with the opinion of Novak and others.<sup>3</sup> Of course, the feminizing granulosa cell and theca cell tumors often, but not always, produce sufficient estrogen for the development of active endometrial hyperplasia. Other ovarian tumors, such as adenocarcinoma fibroma, and cystadenoma, have been known to produce or to be associated with postmenopausal endometrial hyperplasia. Therefore, if the hyperplasia is active and generalized, and if the patient is two years postmenopausal and has not been taking estrogens, laparotomy should be seriously considered. Obviously laparotomy must be done when solid tumor masses can be palpated in the adnexal areas.

3. Retrogressed Hyperplasia. This is an inactive form of hyperplasia which has caused much confusion among pathologists as well as gynecologists. The importance of this condition is not that it causes bleeding, for it probably does not, but that some women bleed who have retrogressive hyperplasia which is incorrectly interpreted as an active hyperplasia. Sometimes this results in unnecessary laparotomy in search of a solid ovarian tumor.

The following case history very clearly illustrates the features of this condition.

Mrs. M. C. Age 55 years. Admitted with a chief complaint of bleeding for six weeks. She was three years beyond the menopause, which was characterized by irregular periods of excessive bleeding. Physical examination, including pelvic examination, revealed no significant abnormalities. A diagnostic curettage revealed a retrogressed hyperplasia; in fact it was a retrogressed cystic glandular hyperplasia. There has been no recurrence of symptoms.

There is little doubt that this represents an inactive form of the hyperplasia which was surely present at the menopause. No one knows<sup>3</sup> how long such an endometrial picture will persist after menopause, but we have observed it as long as eight years after the menopause. Histologically there are two outstanding features.

First, the epithelium is rather low columnar in type and no mitotic activity is present. Stratification of nuclei are very rare. Second, the stroma is even more distinctive. Whereas the stroma of true hy-



perplasia is always very active and crowded with dark staining nuclei with scant cytoplasm, the stroma of retrogressed hyperplasia is quite fibrous, has fewer nuclei, no mitotic activity, and an affinity for eosin stain.

*Endometrial Polyps:* There is more than a little confusion between polyps and hyperplasia. The chief difference is that polyps grow because of a local impetus and as a result grow in an irregular fashion as distinguished from hyperplasia, which has a more uniform generalized activity. Polyps are usually either true endometrial polyps or adenomatous polyps. The former resemble true endometrium and its stroma, and when present during active sexual life they sometimes undergo cyclic secretory changes. This, of course, does not occur after menopause. The adenomatous polyps have less stroma and more papillary gland structure. A third and rather uncommon type of polyp is the adenomyomatous polyp which has smooth muscle in its core. The resemblance to adenomyosis is obvious. Clinically these polyps may prolapse through the cervix but often they are not recognized until the curettage is done. They are rarely malignant, but must be studied histologically. Curettage is the treatment of choice.

*Myomas:* Bleeding from these lesions after the menopause is not common, but it can and does occur. Myomas characteristically regress with the menopause and if abnormal bleeding was not present earlier none will appear unless the original tumor was submucous or unless, as Te Linde<sup>4</sup> has pointed out, shrinking of the uterus after menopause squeezes the intramural myoma so that it becomes submucous. Bleeding myomas after the menopause also suggest the rare sarcomatous degeneration which is present no more than once in two or three hundred myomata. There is little place for radium or x-ray therapy in the management of bleeding myomas. Irradiation acts primarily by castration and only slightly directly on the uterus. The postmenopausal patient is already a physiological castrate, so further effect upon the ovaries is un-

likely. Bleeding usually comes from erosion of vessels about the myoma and the necrotizing effects of x-ray irradiation can be expected to have little value. The treatment of choice is total hysterectomy by the abdominal or vaginal route.

*Miscellaneous:* Into this group fall a host of uncommon and rare causes of bleeding and also those many patients in whom no cause for the bleeding can be found. Many of these cannot be discussed at this time. For example, does hypertension produce bleeding from the endometrium?

*Blood Dyscrasias:* These must never be forgotten. Thrombocytopenic purpura is not a rare cause of postmenopausal bleeding. The bleeding may be a part of idiopathic thrombocytopenic purpura as the following case illustrates.

\*Mrs. L. C. Admitted with a complaint of profuse vaginal bleeding. Diagnostic curettage revealed endometrial hyperplasia. A total hysterectomy was done and more than usual bleeding was noted, but the patient had an uneventful recovery. At the time of postoperative examination the patient was found to have numerous subcutaneous ecchymoses and petechiae. The spleen was enlarged and the platelet count was very low. Splenectomy was followed immediately by a return of a platelet count to normal and a disappearance of bleeding tendencies.

Damashek and Rheingold<sup>5</sup> have recently reported a similar patient age 52 with postmenopausal bleeding due to idiopathic thrombocytopenic purpura.

Few gynecologists are aware that thrombocytopenic purpura can occur with stilbestrol therapy. Watson<sup>6</sup> has reported several instances of such a toxic reaction and we have on one occasion observed postmenopausal bleeding without endometrial hyperplasia, but with a low platelet count. It was assumed that the thrombocytopenia produced the endometrial bleeding. The diagnosis is readily made by a platelet survey from the blood smear, from bleeding and coagulation time, and from a tourniquet test for petechiae.

*Carcinoma of Fallopian Tube:* Mention

\*Presented through the courtesy of the Huey P. Long Charity Hospital, Pineville, Louisiana.

of this in a discussion of benign bleeding is necessary because diagnostic curettage will not reveal malignant tissue. Vaginal cytological smears are of help as is the palpation of an adnexal mass. Treatment is surgical though rather uniformly unsuccessful.

*No Endometrium Obtained:* This is not an uncommon pathological report. If the curettage has been carefully done there should be very few such reports because it is nearly always possible to obtain a few shreds of atrophic endometrium if the physician cures thoroughly and sends every bit of tissue to the laboratory. If no endometrium whatsoever appears on the microscopic slide in spite of a thorough curettage then it is well to suspect that a false passage may have been created by the cervical dilators. We have observed two such patients. In both uterine bleeding recurred and a second curettage was done without obtaining evidence of endometrium. Both patients were subjected to laparotomy and in one there was a carcinoma of the endometrium. The other had a mild endometritis with a cervical stricture. In both a traumatic false passage was present.

A discussion of this type is not complete without a consideration of the patient in whom curettage fails to reveal the cause of bleeding. Such a patient must be reexamined every two or three months for at least a year if there is no further bleeding. If bleeding recurs she should be admitted to the hospital for a second curettage. If at this time there is still no diagnosis then an exploratory laparotomy is the treatment of choice.

#### SUMMARY

All postmenopausal bleeding must be considered as malignant until proven otherwise. Much has been written and said about the treatment of malignant uterine lesions, but what shall the physician do about the benign ones? The fact that the proportion of benign to malignant lesions is increasing in recent years does not mean that there is less carcinoma. It probably means that there are more diagnostic curettages being done and it probably also represents a widespread use of estrogens. The

proper treatment of these lesions depends upon an accurate histological and clinical diagnosis.

The history should always carefully describe the use of estrogens in any form. It should also include the presence or absence of any hemorrhagic diathesis. Vaginal cytological smears may be a part of pelvic examination, but every patient with postmenopausal bleeding from the uterus should have the benefit of a fractional diagnostic curettage and/or biopsy of all suspicious cervical lesions.

Fractional curettage consists of dilatation and curettage first of the cervical canal, and second, the body of the uterus. Both specimens must be kept separate for the pathologist. Such curettage will permit the diagnosis of an early cervical carcinoma that would otherwise be lost by dilution with the more abundant endometrial curettings. It also assists in the differentiation of adenocarcinoma of the cervix from adenocarcinoma of the endometrium.

*Cervical Polyps* are common, usually benign, and may be removed by excision or twisting. They must be examined histologically to rule out carcinoma.

*Cervical Erosion and Cervicitis*, both are common and are readily recognized and treated. A biopsy must be taken to exclude carcinoma.

*Endometritis.* Quite a common lesion and due often to cervical adhesions and stricture. Curettage usually cures. If pyometra is present the curettage should be postponed until drainage is complete.

*Endometrial Hyperplasia.* Active hyperplasia due to exogenous estrogens is often suspected by history. As a rule it is safest to rule out carcinoma by diagnostic curettage and withhold further estrogenic therapy. Active hyperplasia due to endogenous estrogens usually suggests some type of ovarian tumor, most commonly granulosa cell tumor or theca cell tumor. Treatment is by laparotomy if adnexal tumors are felt. If no tumor is felt, laparotomy should be considered if the hyperplasia is unquestionably active and generalized. Endometrial polyps may interfere with cor-



rect histological diagnosis. Retrogressed hyperplasia is the final resting stage of a previous active hyperplasia. It is readily recognized histologically and does not signify coexisting estrogenic stimulation. Patients probably do not bleed from this lesion and the finding is incidental. Curettage is sufficient therapy.

*Endometrial Polyps.* These represent local activity of the endometrium and are usually endometrial or adenomatous in character. They are readily diagnosed histologically but must not be confused with hyperplasia. Treatment is by curettage.

*Myomas.* Occasionally intramural myomas may become submucous after the menopause. Submucous myomas may bleed because of necrosis and degeneration. Diagnosis is usually made at the time of curettage and treatment is hysterectomy. Radium and x-ray have little place in the treatment of bleeding myomas after the menopause.

*Miscellaneous.* Blood dyscrasias, such as thrombocytopenic purpura, may cause postmenopausal bleeding. Of importance is the diagnosis and treatment of the blood dyscrasia. Patients with recurrent postmenopausal bleeding after a diagnostic curettage which has failed to provide a diagnosis should have a second curettage and then laparotomy if the diagnosis is still obscure.

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#### DISCUSSION

Dr. J. Dudley Talbot (Shreveport): Dr. Lund has given us a very excellent paper on handling of postmenopausal bleeding. Still too many doctors are treating these cases the same as they did ten

years ago, that is, curetting their patients for benign bleeding, then at the same setting, placing radium, their reasoning being that in case the pathologist should return a positive diagnosis of malignancy, they have helped the patient in that they have already begun treatment for malignancy. Actually, instead of helping, they may be doing harm. First, because we are destroying our greatest single sign of early cancer, that is bleeding. Second, as Dr. Lund pointed out our D & C may have been incomplete and malignancy was missed. Third, by giving small doses of x-ray or radium we may be promoting growth of malignancy in the cervix and uterus.

Harold Speewert and Thomas Speightal, in a recent survey of 270 cases of malignant tumors of the uterus, found that 21 patients or 8 percent had received previous treatment with x-rays or radium for *benign conditions*. Werner reported 3 cases in which carcinoma of the corpus occurred in women, ages 36 to 47 years, between eight months and seven years following treatment with x-ray. Bland treated a patient, age 56, with 244 mg. hr. of interuterine radium for a myoma. Three years later she was found to have an early endometrial cancer.

Tyrone, in 1947, in his analysis of 436 hysterectomies, cited 7 cases in which cancer of the endometrium developed several years following radium therapy for benign conditions.

Speewert gave the average time interval between an irradiation and detection of the uterine carcinoma in their series as 8.3 years. Their findings, together with previously published data in literature, suggest a possible carcinogenic effect of radiation energy on the human uterine fundus.

Therefore, as Dr. Lund has suggested, let us D & C patients first, leaving off all x-ray and radium therapy until we have a definite diagnosis of malignancy. If the patient continues to bleed in the absence of malignancy, we are justified in repeating our D & C if necessary several times. Usually such benign conditions will be cleared up after the first D & C. However, if this is not the case, a laparotomy with total hysterectomy should be considered.

Dr. Curtis Tyrone (New Orleans): I like Dr. Lund's definition of postmenopausal bleeding, that is, any bleeding which occurs in a woman one year after the menopause. Postmenopausal bleeding is going to become a more important problem, because with the present increase in the span of life more women are going to live longer in the postmenopausal period. I believe that our life span is now some 68 to 75 years whereas 30 years ago it was only 55 years.

Certainly, no fault can be found in the method of diagnosis of postmenopausal bleeding which Dr. Lund has outlined and this was all covered by Dr. Talbot.

To prevent postmenopausal bleeding in women before the menopause, the old advice given to pa-

tients with uterine fibroids was that no treatment was necessary. We are all familiar with Dr. J. A. Corncaden's report that any woman with fibroids of the uterus has three times as much chance of getting a malignancy of the endometrium as of the fibroid. I believe that any woman with uterine fibroids manifesting symptoms at the menopause should have a hysterectomy. It is necessary to talk to these patients and stress the changes of all benign bleeding, but in this day when so much publicity has been given cancer, any bleeding after the menopause naturally causes the patient considerable concern. It is difficult to try to appease these women, or make them realize that such bleeding is benign. Most of them want more assurance than simply that the bleeding is benign; they want the uterus to be eliminated and I can't much blame them. It has been said that when no material is obtained following curetting, the patient may be reassured that she does not have a malignancy but too often this does not give them the assurance they wish. Of course, curettement does not necessarily rule out a malignancy of the endometrium, as no curette has eyes and a focal area of the endometrium could be overlooked. Therefore, I say there should be more widespread use of total hysterectomy in postmenopausal bleeding.

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## CERTAIN ASPECTS OF ECLAMPSIA\*

E. E. DILWORTH, M. D.

AND

N. U. BOOKER, M. D.

SHREVEPORT

This paper is presented in an attempt to analyze certain clinical aspects of eclampsia with a fatal outcome; and, when possible, to evaluate the management of this disease on the basis of the anatomic changes found at autopsy.

### MATERIAL

From 1932 through 1948, 37 cases of fatal eclampsia were autopsied by the pathology department of the Shreveport Charity Hospital. Thirty-three of these patients had severe toxemia with one or more convulsions during the last trimester. The remaining 4 had severe toxemia but expired without having a generalized motor seizure;

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however, autopsy revealed the liver changes usually associated with eclampsia. Eclampsia, then, may be a clinical diagnosis or it may be an anatomic diagnosis seen in the absence of the characteristic signs. The literature<sup>3, 6, 7</sup> is well documented with cases of eclampsia without convulsions.

### MANAGEMENT

Our management of the eclamptogenic patient consists of a conservative regime. We feel that individual evaluation and care of the eclamptic is of utmost importance. Routine procedures have a very limited role in the management of these patients. Failure of strict adherence to sound principles and repeated evaluation of the patient will invariably lead to embarrassing complications. Too often the eclamptic is a victim of overtreatment rather than of her disease.

The drugs of choice in the control of convulsions, we feel, are morphine, sodium phenobarbital, and magnesium sulphate. Small doses of combinations of drugs may prevent the accumulative effect of any one sedative. The aim of sedation is to maintain the patient at a level between drug coma and a hyperexcitable state which lowers the threshold to convulsions. Deep sedation and immobility make these patients likely candidates for hypostatic pneumonia and circulatory collapse. Simple routine administration of sedatives is strongly condemned. The indications for repeated sedation can be derived only from careful frequent evaluation of the blood pressure, respirations, and state of excitability of the patient.

The judicious administration of fluids will prevent waterlogging of these patients. Failure to maintain a balance between intake and output of fluids will precipitate pulmonary edema and congestive failure. We have abandoned the belief that the kidneys can be forced to excrete urine by the use of large quantities of intravenous fluids. The amount of subcutaneous edema, the urinary output, and the status of the lungs, heart, and blood pressure indicate the quantity of fluid needed.

The markedly edematous patient is especially vulnerable to large quantities of fluid. During twenty-four hours, 1500 cc. plus the



amount of urine secreted is sufficient fluid for the average eclamptic. Some patients may, however, require more. There is evidence that 5 per cent glucose may prove as effective as 20 per cent, and with less damage to the veins. Whole blood transfusions are used to combat shock from blood loss or peripheral collapse. After convulsions are controlled and the patient is conscious fluids are given by mouth.

Pregnancy is terminated only after convulsions have ceased and a period of twenty-four to forty-eight hours has elapsed. When the cervix is partially effaced and admits at least one finger, medical induction is attempted; if this fails the membranes are ruptured artificially. In the presence of an unfavorable cervix and the persistence of toxemia symptoms we perform cesarean section. Rarely do we allow the controlled eclamptic to continue her pregnancy. Once labor is induced or begins spontaneously, it is allowed to continue normally and to terminate spontaneously or is ended by low forceps. Local or low spinal anesthesia is used for vaginal deliveries and local for cesareans.

CLINICAL ASSAY

This series is too small to draw any conclusions from statistics, but a few of the more interesting clinical findings are presented.

*Age and Parity:* The age range was 14 to 40 years. Fifty-seven per cent were less than 23 years of age, indicating that eclampsia is more common in the young gravida. As noted in table I, the primiparas had an average age of only 8.7 years less than that of the multiparas. Four of the multiparas were over 34 years of age.

TABLE I  
PARITY AND AVERAGE AGE

Primiparas 23 (64.9%)	20.9 years
Multiparas 14 (35.1%)	29.6 years
Entire group	24 years

The ratio of primiparas to multiparas was 2:1. Generally eclampsia is seen about three times more commonly in the primiparas. The average parity for the multi-

paras (10) was 5.1. The greatest number of pregnancies for one patient was 16.

*Color:* Thirty-six of the patients were colored. This is not representative of the ratio (5:1) of colored to white admissions to the service, but is in keeping with the idea that colored women are more apt to develop serious toxemic complications than are white patients. (During the last seven years the ratio of colored to white eclamp-tics seen on our service was 7.7:1 and all of the fatal cases during this period were colored patients). This difference may be due to poor diet, the lack of prenatal care and the high incidence of pre-existing vas-cular renal disease among colored women.

*Prenatal care:* As might be expected the incidence of good prenatal care is very low in a series of this type. Only 1 patient had what was termed good prenatal care. About 16 per cent of patients delivered on our service have visited our prenatal clinic, but the remaining 84 per cent have very poor if any prenatal care. None of the patients in this group was enrolled at our clinic. This confirms the feeling that adequate pre-natal care is essential if the incidence of toxemia is to be reduced.

TABLE II  
PRENATAL CARE

Good	1
Fair	0
Poor	9
None	27

Prenatal care must include careful eval-uation of water retention as indicated by weight gain and the appearance of edema, any significant change in blood pressure, especially the diastolic, and the presence of albuminuria. These are the early signs of toxemia and the appearance of any one of these findings should be a warning for ener-getic medical treatment.

*Past History:* Only 1 of these patients had previously experienced convulsions; however, this represents 23 per cent of the multiparas. Two had kidney disease of un-known duration and type, and 3 had a his-tory of hypertension of undetermined dura-tion. Probably many more of these patients

had previous hypertension, but the histories were often incomplete.

*Signs and Symptoms:* The usual signs and symptoms of toxemia of pregnancy were found in this group. A history of headaches, edema, dyspnea, and convulsions was most outstanding. These symptoms appear late in the course of preeclampsia, indicating that on admission the disease was far advanced in most cases. The findings (hyperpyrexia, coma, tachycardia, dyspnea) indicative of poor prognosis were prevalent.

TABLE III  
SYSTEM REVIEW

Edema .....	31
Headache .....	23
Dyspnea .....	19
Convulsions .....	17
Visual disturbances .....	11
Vomiting .....	6
Epigastric distress .....	6

*Convulsion:* It is significant that only 17 of these patients had convulsions prior to admission. This means that 16 had the first convulsion (4 had no convulsions before or after admission) after reaching the ward. Failure to sedate adequately on admission, during labor, and in the early postpartum period, is definitely an outstanding error in management. At least 12 patients had inadequate sedation prior to the first convulsion.

Failure to check the blood pressure frequently during labor was a common error in the management of the patients who were admitted prior to the onset of convulsions. Too much emphasis cannot be placed on the significance of the blood pressure rise during labor in certain patients. Uterine contractions may be the stimulus for convulsions as is indicated by the fact that 11 patients had the first convulsion during labor. (Fifteen patients had the first convulsion prior to the onset of labor and 7 had the first convulsion in the early postpartum.)

TABLE IV  
TIME OF CONVULSIONS

Antepartum .....	15
Intrapartum .....	11
Postpartum .....	7
No convulsions .....	4

The greatest number of convulsions by one patient prior to admission was nine (2) and the greatest number that any patient had after admission was eight (1). It is of interest that no patient had a total of ten or more convulsions, contrary to what one would expect to see in 37 cases of fatal eclampsia.

TABLE V  
PHYSICAL FINDINGS

Hypertension .....	34
Tachycardia .....	26
Convulsions .....	23
Edema .....	22
Coma .....	22
Hyperpyrexia (103°F.) .....	15
Cyanosis .....	4

*Hypertension:* Thirty-four patients had a hypertension of at least 140 systolic and 90 diastolic prior to exitus. Only 3 had no definite demonstrable hypertension, but 2 of these were in shock on admission and died prior to improvement, and the third had only one blood pressure recording on the chart. Twenty of the group had hypertension of 180 systolic or 110 diastolic or higher after admission. The patient is in greater danger of eclampsia if she is a young primipara with a blood pressure of 150/90 and persistent albuminuria than if she is an older patient with a blood pressure of 170/110. Failure to realize the gravity of an elevated diastolic pressure is not an infrequent error in the management of toxemias.

*Coma:* The high incidence of prolonged coma is not unusual in a series of this nature. The sudden development of deep, prolonged coma in an otherwise mild eclamptic should suggest the development of marked cerebral pathology. It should be mentioned that one may have difficulty in differentiating between true coma and stupor from heavy sedation.

*Blood and Urine:* No unusual urinary findings were noted. The majority showed rather marked albuminuria, casts and cells. One patient developed lower nephron nephrosis and died of uremia twelve days after delivery. None of the others showed an elevation of non-protein nitrogen.



*Duration of Pregnancy:* Twenty patients went to term as calculated by menstrual history. The range of pregnancy was twenty-eight to forty weeks with an average of 37.1 weeks.

*Labor and Delivery:* Nine patients had no labor; 8 died prior to the onset of labor and 1 was delivered by cesarean section in 1932. (This patient was a 30 year old primipara at term who had 2 convulsions prior to admission. She was sectioned immediately after arrival to the hospital while in a comatose state and *even after* the diagnosis of intrauterine fetal death was made. She went into shock and died four hours after section. The cause of death at autopsy was eclampsia.) Four patients died prior to delivery after variable periods of labor. There were 12 patients who expired undelivered. No prolonged labors were noted in the entire group.

TABLE VI  
LABOR AND DELIVERY

Delivered .....	25
Spontaneous .....	18
Operative .....	7
Forceps .....	6
Cesarean .....	1
Not Delivered .....	12
Antepartum deaths .....	8
Intrapartum deaths .....	4

The immediate fetal mortality was very high, a total of at least 28 infants (2 sets of twins), including 12 undelivered, were lost. Others may have expired during the neonatal period as follow-up of the infants who entered the nursery alive is not complete.

TABLE VII  
INFANT MORTALITY

Undelivered .....	12
Stillborns (2 sets of twins) .....	14
Neonatal deaths .....	2
Total .....	28
Percentage of mortality: 75.7	

ANATOMICAL CHANGES

It is conceded that eclampsia is a systemic disease involving primarily the vascular system. The organs involved and the extent of the pathology may vary with the suscep-

tibility of the individual and the severity of the toxemia, while the pattern of the visceral lesions is dependent upon the type of terminal circulation found in the individual organ. The old concept that eclampsia is primarily a liver disease arose from the observation that hepatic lesions are usually present in patients dying of this disease. We now recognize that other organs present changes which are just as significant as the liver necrosis in that they reflect the altered physiology of the vascular system and may in themselves be responsible for the death of the patient.

The theory that the altered physiology and the pathological lesions seen in the pre-eclampsia-eclampsia syndrome are due to generalized arteriolar spasm is becoming very popular. Irving<sup>5</sup> was one of the first to advocate this theory, and recently others<sup>9, 10</sup> have expressed the belief that angiospasm is the basic lesion of the toxemias of pregnancy.

The sequence of events as cited by Dexter and Weiss is as follows: A generalized vasospasm causes hypertension which leads to small arterial and arteriolar changes; this produces ischemia and necrosis of tissue distal to the spasm; release of the spasm results in hemorrhage.

The important anatomic changes found in our series are presented in the following section. No attempt is made to correlate these findings with a theory for the pathogenesis of eclampsia.

*Liver:* Degenerative lesions of some type are almost constant in the liver. The characteristic gross lesions are irregular areas of hemorrhage associated with necrosis of or atrophy of the liver cords. In our series the outstanding gross lesion was subcapsular hemorrhagic necrosis of the liver. This anatomic lesion was noted in 34 cases, and was described as marked in 23 cases, moderate in 8 instances, and scanty in only 3 patients. The lesion was usually most marked in the right lobe.

The microscopic liver change consists of hemorrhage necrosis which is usually, but not necessarily, found around a portal space. In our series the microscopic lesion

was limited to periportal necrosis in only 15 cases. In 6 cases the distribution was both peripheral and central, and in 2 instances the necrosis was found only in the central portion of the lobule.

Anemic infarcts have been described but were absent in our series. Thrombosis of portal vessels was occasionally seen.<sup>4</sup>

The liver lesions are not present in all cases dying of eclampsia, as was shown by one of our patients who had a typical clinical course, but showed no liver changes of note on microscopic examination. However, one in unable to state that liver changes are entirely absent unless serial sections are done. It is of interest that the liver lesion may be scanty or absent in patients with long standing toxemia symptoms and die soon thereafter. Way<sup>3</sup> was not able to correlate the amount of liver pathology with the duration of the toxemia. Most authors feel that the liver lesions are reparable as no liver disease has been noted in patients dying from other causes after recovering from eclampsia.

*Kidney:* Grossly, the kidneys may appear normal, or only slightly enlarged. They may be pale or grayish white in color, or if congestion is present, they may be of such deep dark red color that the markings may be obscured. No gross pathognomonic kidney lesion has been observed.

The important changes are seen in the glomeruli which are bloodless and so swollen that they fill out the entire capsule. The capillary basement membrane is usually thickened and may even be duplicated. Bell<sup>11</sup> feels that the thickening is due to an increase in substance, while others take the view that simple edema causes the swelling.

The afferent or preglomerular arterioles are thickened and may undergo necrosis with thrombus formation.

Symmetrical necrosis of the cortex is occasionally seen. Here there is almost complete necrosis of the cortices of both kidneys with thrombosis of the interlobular arteries.

The tubular changes vary from cloudy swelling to degeneration and are not char-

acteristic of eclampsia as they are seen in numerous other diseases.

Accompanying renal changes were prevalent in this series as noted in the following table:

TABLE VIII  
ADDITIONAL RENAL LESIONS

Pylonephritis .....	8
Acute .....	1
Chronic active .....	5
Healed .....	2
Hydronephrosis .....	9
Dilated pelvis .....	5
Lower nephron nephrosis .....	2
Arteriosclerotic (marked) .....	2

The kidney lesion known as lower nephron nephrosis is becoming very popular in obstetrics as well as in other fields. Clinically, this lesion is hard to establish, but we have noted several severe toxemias develop urinary suppression in the absence of transfusion reactions and premature separation of the placenta. We make no attempt to postulate what role the toxemia per se may play in the production of this lesion, but merely mention it in passing.

One of the patients who exhibited this type of lesion had received sulfathiazole prior to admission and died of uremia. The second patient developed urine of a port wine color after remaining in a shocklike state for approximately ten hours. The cause of death was listed as "eclampsia".

*Brain:* The changes that occur in the brain of patients dying of eclampsia are edema, thrombosis of cerebral vessels, intracerebral hemorrhage, and subarachnoid hemorrhage.

Edema of the brain is indicated by flattening of the convolutions, and by the wet appearance of the tissue on section. Edema here is due to the same factors that cause edema elsewhere. In this series edema was prominent in 19 of 22 brains examined. Death was not attributed to edema in any case, although this may be the cause of exitus in certain cases. The relationship of cerebral edema to convulsions and coma is debatable. Three patients who had no demonstrable cerebral edema had generalized motor seizures.



Cerebral thrombosis was observed in only 1 case in this series. She was a 15 year old colored primipara with no history of previous hypertension or syphilis. Usually the lesion is found in older patients with evidence of chronic vascular lesions of long standing.

Intracranial hemorrhage is common in eclampsia. DeLee<sup>8</sup> reports the incidence as high as 40 per cent. The hemorrhage may be scanty or focal in nature or it may be massive, similar to that which is seen in chronic vascular disease.

Hemorrhage was observed in 7 of the 22 brains examined in this group, an incidence of 31.8 per cent. The hemorrhage was massive in 6 cases and was the cause of death in each instance. Focal subarachnoid hemorrhage was present in a 14 year old colored primipara.

The youngest patient with massive cerebral hemorrhage was a 19 year old colored primipara. The average age for these 6 patients was 33.5 years. Two had a history of long standing hypertension, and 1 of these had eclampsia with a previous pregnancy. One had a history of renal disease of unknown type and duration. Two out of 3 with negative histories were primiparas who died without convulsions.

*Adrenals:* Recently considerable interest has been shown in the changes found in the adrenal gland of patients dying of eclampsia. Briefly, the pathology observed is necrosis and hemorrhage of the cortex. Way<sup>3</sup> reported that 11 of 33 eclamptics showed this lesion, and concluded that there may be a relationship between adrenal damage and the familiar shocklike syndrome that occurs in eclampsia. In the present series 6 cases showed varying amounts of hemorrhage and necrosis of the adrenal cortex. Review of the clinical course shows that 1 patient went into shock and expired within fifteen minutes, the cause of death being undetermined. Another patient went into sudden coma, shock, and died fourteen hours later, autopsy disclosing a massive pontine hemorrhage. Two other patients were in shock for at least twelve hours prior to exitus. The question may arise as to

whether the shock precedes or follows the adrenal changes as these anatomic changes have been noted in patients who remained in shock from causes other than eclampsia.

*Lungs:* Pulmonary edema, atelectasis, and pneumonia appear frequently in the course of eclampsia. Six patients developed clinical evidence of acute pulmonary edema. Autopsy revealed marked pulmonary edema in ten cases. Death was due to the complication in 4 instances. Thirteen cases showed moderate pulmonary edema.

Atelectasis was observed in 5 cases, usually accompanied by pneumonia. Pneumonia was the cause of death in 1 case. This complication can be largely prevented by the use of antibiotics, by the omission of oral fluids during the convulsive stage, and by the judicious use of sedatives.

*Heart:* The heart was the site of significant anatomic changes in many cases. In 10 instances the heart was definitely hypertrophied, weighing more than 400 grams in 7 cases. On the basis of cardiac hypertrophy, the incidence of heart disease was 27 per cent.

Five patients under 30 years of age with cardiac hypertrophy had no history of chronic vascular-renal disease and no additional evidence of myocardial or vascular-renal disease was noted at autopsy. Therefore the cardiac hypertrophy may support the feeling that toxemias of pregnancy may in some instances produce heart changes of note. We feel that the cardiac hypertrophy in these cases is too great to be on the basis of pregnancy alone.

Five patients above the age of 30 years had a definite history of underlying vascular-renal disease and/or showed additional anatomic evidence of the same. Extreme care must be used in evaluating the vascular-renal status of eclamptic patients in order to avoid as far as possible the complications that may arise on the basis of these changes.

Marked pericardial and subendocardial petechial hemorrhages were noted in 5 instances and less extensive similar changes were found on 8 occasions.

Fluid in the body cavities was very com-

TABLE IX  
HEART

Age	Parity	Heart weight in grams	Other evidence of car- diac or vascular- renal disease	History of vascular renal disease
16	0	420	Active pyelonephritis (kidney not contracted)	Negative
20	0	500	None	Negative
22	0	400	None	Negative
28	3	500	None	Previous eclampsia
29		450	None	Negative
35	0	600	Massive cerebral hemorrhage	Kidney disease?
31	3	370	Massive cerebral hemorrhage. Arteriolosclerosis of kidneys	Previous eclampsia
39	13	410	Massive cerebral hemorrhage. Fiedler's myocarditis	Hypertension, 2 years Hypertension
34		420	Uremia, lower nephron nephrosis, Fiedler's Myocarditis	Negative
35		400	Mural thrombi	Negative

mon in this group of patients. Ascites was present in amounts of 3000 cc., 2000 cc., 1500 cc., 750 cc., 350 cc. (twice), and 200 cc. (thrice). Pericardial effusion ranging from 60 to 250 cc. was noted on 12 occasions. Again, the danger of overloading the vascular tree with parenteral fluids must be stressed.

*Cause of Death:* The cause of death in eclampsia still remains a mystery in many instances. This is true from an anatomic as well as a clinical viewpoint. In the present group of necropsies, the anatomic lesions which were described as the cause of death by the pathologist are listed below.

TABLE X  
CAUSE OF DEATH

Intracranial hemorrhage .....	6
Pulmonary edema .....	4
Pneumonia .....	1
Uremia .....	1
Hemorrhage, postpartum .....	1
Eclampsia .....	24

The familiar shocklike state that one sees in this disease is by far the most common terminal picture. Pulmonary edema and cerebral hemorrhage are the two most common anatomic changes that can be definitely listed as the cause of death. Clinically, pulmonary edema appears commonly prior to exitus and was thought to be the cause of death in 3 additional cases, but this was not confirmed at autopsy.

## CONCLUSIONS

The conclusions we have gradually come to after studying the clinical courses and autopsy findings in this group of cases are not new, but we think they are sound.

1. The toxemia syndrome is better understood by considering it as a systemic disease of the vascular tree. The symptoms vary with the degree of arteriolar spasm and with the amount of injury to the various organs.

2. The frequent involvement of vital organs either by pre-existing vascular-renal disease or toxemia makes it mandatory to carefully evaluate the cardiovascular and renal systems in order to avoid complications which may be due to disease and/or overtreatment.

3. A conservative attitude in the management of the eclamptic patient is well founded. Individualization and repeated evaluation of the patient is the basic principle of management.

4. Therapy cannot be relaxed once the convulsions are controlled and diuresis established. The mother is never safe until the baby and placenta are out of the uterus. This does not advocate hasty operative delivery, but is, we feel, a conservative attitude.

5. A high fetal mortality is to be expected with conservative management. After the development of convulsions the baby must be ignored if the maternal mor-



tality is to be reduced. This does not apply to the preeclamptic or controlled eclamptic group.

6. Adequate prenatal care remains as the best weapon against eclampsia. One must never wait for the appearance of headache, dyspnea, vomiting, epigastric pain, and marked hypertension before becoming concerned. These are the symptoms and signs of advanced preeclampsia and impending convulsions. Treatment must begin long before this.

7. We have had 1 eclamptic patient die of hemoglobinuric nephrosis, a type of lower nephron nephrosis. There have been other preeclamptic and eclamptic patients who exhibited this syndrome clinically. It is a little difficult to prove in patients who survive, but we especially wanted to express our opinion of the importance of this interesting syndrome in obstetrical patients, rare though it may be.

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#### DISCUSSION

Dr. E. L. King (New Orleans): First of all I want to stress the main conclusion which is the necessity of proper prenatal care.

The second point is that we should not wait in cases of toxemia until they develop headaches, vomiting, visual disturbances, before we get concerned. The time to get worried is when the blood pressure starts up, long before they have any symptoms. Another point I think we can well stress is that treatment is not to overload these patients with fluid. Very interesting work in this connection was done by Arnold and Fay in Philadelphia a good many years ago. They went even further than most of us, in that they stated that the patient did not receive in one day any more fluid than she

was able to put out as urine during the previous twenty-four hours.

We also agree that the patients should not be delivered during the convulsive stage; they should be delivered either before they develop convulsions or after they have recovered from this acute attack, and the labor should be as conservative as possible.

In 100 cases treated at Charity in the past few years, 10 cases died. Sometimes we run a better average than that, but that was the average for that 100. The high percentage of brain lesions is interesting. We have no doubt overlooked this cause of death at Charity Hospital, as the skull is frequently not opened at autopsy.

Dr. Norman U. Booker (In conclusion): The question was asked, as I recall it, whether the increase in weight of these hearts was due to edema or hypertrophy. They were described by the pathologist as being of the hypertensive type.

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## TITANS OF PSYCHIATRY—SIGMUND FREUD AND ADOLF MEYER\*

T. A. WATTERS, M. D.

NEW ORLEANS

A comparison and contrast of the work and teachings of Sigmund Freud and Adolf Meyer is both timely and provocative, for they are the prevailing influences that shape the theory and practice of psychiatry today.

Freud, a Jew, was born in Freiberg in Moravia in 1856, and brought up in a strong background of traditional German schooling, with all that this implies. Always a serious student, from the beginning he excelled in the studies which ultimately led him into medicine. For years he did experimental work in the laboratory, making some of the first cocaine experiments, and particularly devoting himself to organic neurologic research. He entered psychiatry proper near the age of twenty-nine with a broad yet precise anatomic and physiologic knowledge of the nervous system based on a long period of laboratory work and clinical neurologic experience.

In psychiatry he found a field of work barely defined, largely nosologic and de-

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scriptive, and poorly formulated. Upon this confusing and undeveloped field, he brought to bear keen observation, an experimental attitude, and patience. Although his observations and conclusions drawn therefrom excited invidious opposition and acrimonious attack from many quarters, he, nonetheless, quietly pursued his course, and over a long lifetime slowly saw his labors bear rich fruit and his work substantiated and vindicated by experience and time.

Ten years later Adolf Meyer, the son of a Zwinglian minister who had rebelled against Calvinistic doctrine, and nephew of a physician, was born in 1866 near Zurich in German Switzerland. Early in life he showed his liking for medicine, beginning with an emphasis on neuro-anatomy, then neurobiology, pathologic anatomy and neurology, and finally psychiatry. Hoping for broader opportunities, he came to America, where much of his early work was in State hospitals. Having worked for considerable time in pathology, he, like Freud, brought extensive knowledge of the structure and function of the nervous system, as well as a great deal of experience, into his more specific work in psychiatry. As a clinical neurologist and psychiatrist, he became impatient with the compulsive, foolish, and fallacious searching of many of his colleagues who persisted in looking for a structural explanation for the many things man did, felt, and thought when he went awry. For he conceived of a physiology and pathology of the person himself as well, and not just of his isolated functions and parts. Accordingly, he studied man's behavior, his total performance, always in terms of that live and whole man, rather than a corpse or a disordered part or system, or a disorder itself separate from the individual who harbored it. He never lost his focus upon the sick and distressed person himself.

With a prevailing attitude quick to exclude anything not organic in orientation or colored with a physical patter, medical educators more easily accepted Meyer's plausible and unruffling approach to man. Thus the induction of psychiatry into American medical schools was facilitated at a time

when there were strong resistances against psychiatry in general, let alone Freudian facts and theories. So Meyer's theories of personality function and therapy being more readily acceptable at this juncture than were Freud's, were partly the reason, he was so successful in introducing psychiatry not only into medical teaching, but into other quarters too, as well, which formerly were entrenched against it.

Freud, too, took a keen interest in the functioning of the individual in terms of his life experiences, past and present. Stimulated by an older colleague, Breuer, he became interested in hysteria and hypnosis, using the latter to obtain from his patients an understanding of the influence of dissociated components upon their behavior. He quickly ascertained thereby the presence of a domain of human motivation and thinking and feeling beyond the pale of consciousness. Time and time again he found evidence to support this concept. Fascinated by his discoveries, and widening their application, he showed that evidence existed of the unconscious at work in certain mistakes and slips in everyday life—in wit, in humor, and particularly in neurotic symptoms and behavior. He, too, found that in dreams there were many things that betrayed the presence of unconscious trends when decoded according to a scientific method that he developed. However, in working with his patients, he shortly replaced hypnosis with free association in which his patients talked freely, without selection or restraint, as a more effective way of understanding motivations and meaning in their actions and their distress that otherwise might be missed. He was also struck by the phenomenon of transference, wherein the patient reacted in the present in certain ways to the therapist and the therapy, repeating attitudes and behavior patterns of the past with reference to some important person in his life, usually a parent or parent figure. Thus with free association and dream interpretation, and with a study of transference and of resistance to certain issues and insights accruing in the flow of verbal material and behavior, unrealized motivation and the



meaning of the patient's disorder became clear and gradually accepted as a part of his widened and acknowledged range of consciousness.

Freud thus studied the unconscious or the area of repressed motivation underlying the behavior of his patient. Early in his career his studies were predominantly on neurotics, but he soon found that the laws which appertained in the minding functions of the neurotic were the same as those in the so-called normal person. Furthermore, it soon became evident that between these two it was not a matter of difference but rather one of degree. On the basis of his findings, he ultimately gave us a dynamic concept of the growth and unfolding of the human story based on a biology of finding sustenance, security, and satisfaction. He found in man as he studied him, fundamentally two drives—an altruistic, procreative sex drive as part of his love life, and an aggressive, competitive drive serving him for defense and offense, for achievement, and for security. He gave us a broad understanding of such motifs as love and hate, guilt and expiation, and fear of loss of love, and of retaliation—all of which have come to be extremely dynamic concepts in the practical treatment of nervous disorders.

From his observations, he gradually conceived of the personality as having certain functional and dynamic components: the ego, or conscious personality, whose role was to adjust man's inner needs to his outward circumstances in accord with certain restricting attitudes proclaimed by the conscience, or superego; and lastly the id, which represented man's undomesticated inner drives. Withal he never failed to consider man's constitution and heredity and environment, and readily gave them their place. Yet he extended the concept of environment beyond simple physical surroundings to include the interpersonal circumstances into which the child was born and in which he did or did not thrive or progress in his emotional maturation during the formative periods of infancy and childhood. On the other hand he narrowed the

scope of heredity<sup>1</sup> to more proper dimensions by showing that much behavior too easily attributed to this factor could be traced rather to certain unconscious components at work within the personality. By forcing a recognition of these dynamisms, Freud made man more directly responsible for integrating them into his conscious personality and ultimately into a more rational pattern of conduct.

In his study of the love life of man, Freud gave us a history of its growth and development from infancy to adulthood in terms of both genetics and dynamics within the child's interpersonal relationships that conditioned him from early in life. He demonstrated the so-called Oedipal phenomena wherein the child related himself to his parents with feelings and attitudes, some of which might be turbulent, or even violent. He showed how these Oedipal components together with others, if mastered and adequately repressed, merely constituted problems with which everyone must deal, but which are solved if interpersonal circumstances permit. However, if unmastered, these same components remained within the growing personality as a neurotic core.

Early in the course of this study, and to the consternation of those who otherwise presumed it to be objective, Freud brought forth his concept of infantile sexuality. At this time sex activities were not recognized or accepted as a part of normal development before they unmistakably flowered at puberty, and any earlier manifestations were discouraged and often harshly punished by the parents, and at best glossed over by the medical profession itself. So when Freud revealed facts about the fearful and forgotten area of childhood covered by what he called infantile amnesia, and demonstrated that in the earliest years there were sex phenomena, (not of a reproductive nature in terms of the adult, but sex, nonetheless), and showed that in the growing, but bewildered mind of the child much perverse behavior was encountered, even his colleagues were squeamish and resentful and slow to admit the truth. Yet Freud

merely pointed out that there was evidence of a gradual purposeful maturing of the sex drives and attitudes from birth in response to natural physical and emotional stimuli in the environment, and that the perverse behavior sometimes found was the result, generally, of unfortunate parental attitudes, and of natural curiosity, theorizing, and experimentation upon the part of the child. Subsequently, much confusion has arisen, both because of resistance to the fact that children could have sex feelings and drives, and because Freud applied the term "sex" to a wide area of activity\*

These investigations in regard to infantile sexuality had implications as well for perversions in love life, which previous to his discoveries were neither understood nor viewed with constructive insight nor an amelioristic approach, but rather unequivocally condemned, or at best shrugged off, if not vindictively punished by society. Thus while Freud's theory of infantile sexuality proved to be disturbing, it has been validated by experience time and time again and will endure, for on this discovery alone much neurotic behavior becomes understandable and subject to modification.

Meyer, too, saw man as an individual functioning in a certain physical and emotional environment. But where Freud studied and utilized the unconscious, Adolf Meyer, on the other hand, rather exclusively worked with the consciously regulated functions, shying away from the unconscious factors that he thought of rather as less available assets. Hence he constructed a theory of human behavior more exclusively objective and less subjective than did Freud. He looked upon consciousness as "man's greatest biological achievement in bettering himself", and as "the integrating function of the whole man". Emphasizing life itself, Meyer worked in terms of the real and fully conscious attitudes and gave us concepts of subject organization and per-

sonality organization and a method for appraising man as an individual.

Steering clear of the "imagined cesspool of the unconscious",<sup>2</sup> he avoided the "self-referring" function and often drove at those who laid emphasis on the less domesticated tendencies in civilized man. Though never denying the existence of unconscious factors, by skirting them he left unattended a vital area of human function that indubitably calls for consideration and handling in any full and well rounded therapy. Rather Meyer emphasized the functions and assets of the total person and mobilized any resources in the environment or modified it where necessary and feasible. As for the unconscious, "he did not scratch where it did not itch"<sup>3</sup> the patient, thereby falling short of therapeutic opportunities — certainly for deeper changes where an alteration in the structure of the patient's personality would make a difference in the end result, and one more lasting. All in all, Meyer gave a broad pragmatic approach to nervous disorder, together with a great wealth of valuable studies of conscious functions, whereas Freud gave us not only a knowledge of the conscious personality and its technics in dealing with unconscious areas, but also a procedure that penetrates the deep layers of the personality to study these areas.

Following in the footsteps of Freud, the analyst today, in his interpersonal relationship with the patient, uses transference and countertransference attitudes and phenomena, and resistances and their analyses in attacking neurotic disorder. In the course of therapy he sees the core of the disorder gradually come to the surface and into the conscious personality of the patient, and knows that it developed over the preoedipal and oedipal periods, when envy, jealousy, hate, guilt, and fear arise in connection with parents and siblings. The analyst, too, sees the workings of repetition-compulsion, wherein patterns of symptoms and symptomatic behavior repeat themselves in consequence of conflicts — which Freud also pointed out. From him, too, he has an understanding of the deep drives and im-

\*Here possibly the term "love" is better and more inclusive. For from the very beginning to the very end of life there is love and the need for love—in which sex is a component and intercourse one consummation, but not the whole story.



pulses that underlie all behavior, either that sufficiently domesticated to be called normal or standard, or insufficiently domesticated to be termed abnormal, as exemplified in neurotic distress.

We observe that psychoanalysis is not applicable to every case, but rather is essentially usable in the neuroses and neurotic characters, when intelligence and ego strength can constructively assimilate deep insight with corrective change. However, with time, the modifications in psychoanalytic therapy have given us dynamic methods to study and treat nervous disorders over a progressively wider range of afflictions, including even the psychoses. While with more economical procedures carried out by mature, well trained, and well experienced therapists, treatment may be extended to include an ever broadening range of human besetments. It is, in short, a vital and effective therapy that strikes deep into the character structure, enabling the sufferer to rebuild his life and living on a more mature and successful foundation.

Meyer, too, developed a therapy he called distributive analysis and synthesis. Like his theory of personality function, his treatment of personality disorder was more superficial and worked with the conscious personality, presumably dealing with the deeper strivings, but not really mobilizing them in full terms as the Freudian therapist does with the unconscious. Thus these deeper opportunities for therapy remained untouched and allowed the neurotic nucleus to remain entrenched. Too, Meyer's therapy was deprived of the great value of analyzing and working with transference and resistance in the emotional give-and-take of the physician-patient relationship that gives such impetus to analytic therapy. Rather distributive analysis works more in the framework of a warm, sympathetic, and friendly rapport, and usually little, if any emphasis is given to unconscious motivation. Yet this broad, general, and infinitely reasonable approach, extremely methodical in its own right and way, served principally as a workable therapy for the mass of nervous persons. In its recourse to improving

the environment of the patient while treating him, it is well adapted to wide usage in the psychoses and mild neuroses. It is to be especially emphasized that Meyer's insistence that each case be treated, not as an example of a particular disorder, but rather as a disorder of that individual person, modified the fatalistic and even nihilistic attitude that had prevailed in regard to the psychoses, particularly the schizophrenias. He demanded integrated medical consideration for the whole man: an inquiry into the conditions under which he became ill, what modifications were needed for his improvement, and the marshalling of opportunities for his therapy. A consideration of such specific factors in each case fostered a refreshing and stimulating attitude for studying the patient as "an experiment of nature", and of finding therapy unique for that person. It was Meyer's shrewd and courageous attack upon descriptive and nosological self-sufficiency that brought a new orientation that changed the course of psychiatric thought.

However, in the more severe chronic neuroses and the so-called character disorders where deep therapy is required, Meyer's therapy is less effective. Further, unless it is carried out in the hands of extremely well trained persons, there is the possibility of bewilderment and confusion, and of losing both consistency and sequence, and it never becomes the moving therapy with dramatic changes encountered when transference is employed and analyzed. Many speak of the Meyerian as an eclectic but it is difficult to consider him a true eclectic functioning with broad assets and free spirit if he has not had the proper training in the use of free association, dream interpretation, and the use of transference. However, taking into consideration Meyer's generally broad and flexible treatment of nervous disorder, and his great contributions to psychiatry, it would be narrow to quibble on the point of strict eclecticism.

One concedes that there is no all inclusive or perfect therapy in psychiatry, yet in the main there is not another field of medicine

where there are more effective therapies that can be employed for certain disorders where indications warrant and objectives are shaped. There are, for example, the more superficial therapies of counsel and advice; the deeper therapy of distributive analysis and synthesis; and the deep, moving, and reshaping therapy of psychoanalysis. We can make a comparison to surgery in this respect, where there is the more superficial surgery for minor or cosmetic disorders, or a deeper surgery for internal disturbances, or a deep and devastating surgery for growths requiring considerable dissection when they have invaded the person; then, too, we find the more prolonged surgery of a reconstructive nature such as orthopedic and plastic surgery. Similarly we have psychotherapy superficial and deep, short and long, just as we have surgeries superficial and deep, short and long.

In brief, the shaping situation today seems to be one where there is a healthy growth without antagonism between the discoveries and teachings of these two great physicians. Meyer gave us a sound and comprehensive understanding of consciousness with its degrees and variations and laws of operation based on a broad objective approach to the total living person in his milieu. His theories and methods were more readily assimilated into the body of medical tradition than were Freud's, and by softening the general attitude toward psychiatry, he incidentally promoted a less grudging recognition of what psychoanalysis had to offer, for they served as a buffer until the unconscious factors in human behavior could be accepted more readily and with less anxiety. Freud, on the other hand, gave us an understanding of man's unconscious life and a method of research and a therapy profoundly moving and effective, striking at the more subjective personality, with special emphasis on the repressed area that comes to conflictual and repetitive expression. While it is true that his theory of personality function and his research method are less acceptable to the conventional minded, they are nonetheless valid for

studying not only man himself, but man's productions as well. In fact the contributions of psychoanalysis to the fields of medicine, psychology, sociology, and anthropology, not to mention myth, literature, and art, are generally recognized and accepted.

It seems clear, then, that the psychotherapy of tomorrow will embody the sound discoveries and teachings of these two great men. One cannot help but be a better psychiatrist by knowing and employing the teachings of Sigmund Freud, or a more competent psychoanalyst by knowing and employing the teachings of Adolf Meyer. In short, the desideratum is a psychotherapy that will synthesize and bring into effective influence the wisdom, teachings, and scientific achievements of both of these masters in psychiatry, and the successful student and therapist of the future must have a knowledge and command of both.

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### PSYCHOANALYTICAL METHODS OF STUDY OF PATIENTS\*

ANNA C. D. COLOMB, M. D.  
NEW ORLEANS

Psychoanalysis is a medical procedure in the special field of psychiatry. While general psychiatry concerns itself largely with care and treatment in the psychoses, psychoanalysis is employed more specifically in the neuroses, and personality and emotional disturbances. Psychoanalysis was an outgrowth of the beginning of the psychological approach in mental illness. Psychoanalysis, in turn, enriched psychiatry by its contributions to the understanding of everyday human mental life and its problems. Psychoanalytic theories and concepts did much to further the development of present day dynamic psychiatry. Psychoanalysis is, simultaneously, a therapeutic

\*Presented at meeting of the Orleans Parish Medical Society, November 8, 1948.



tic method in the neuroses and a research method in the mental field.

Psychoanalytic theories, concepts, and clinical technics stem from the original work of research-minded Sigmund Freud, a Viennese physician. He began his medical career in 1881, doing research in neurology until financial responsibilities forced him into the clinical field. He had the wish to understand the nervous states, and, studied and used the then known methods of hypnosis and mental catharsis in his cases. He soon abandoned these methods as his further clinical experiences led him to the development of psychoanalysis. From then on, Freud devoted his life to the study and development of psychoanalytic concepts and technics. What he observed in his patients, he also applied to the mental life of healthy persons. Although there have been significant theoretical contributions and minor modifications of technics by other workers in the field, the main body of knowledge, the principles and clinical technics as developed by Freud have stood the test of time in clinical practice, and are the basis of all analytical teaching and practice. The difference in the so-called schools of psychiatry is largely a matter of emphasis.

Psychoanalysis maintains that there is an unconscious as well as a conscious mental life, that very powerful unconscious processes and ideas can produce in the personality all the effects that ordinary ideas do without themselves becoming conscious, and that it studies this unconscious mental life. Psychoanalysis further maintains that the source of these unconscious processes and ideas lies in the deeper instinctive and emotional needs of the individual; that mental phenomena are the result of the interplay of primitive needs and the influence of the environment on the expression and manifestations of these needs; and that the mental life of any individual has been conditioned by the history of the individual. Characteristic of most neurotic patients is their emotional immaturity, as evidenced by their difficulties in personal relationships and inadequacy in handling reality situations. This is a reflection of earlier

reaction patterns which may have been retained as such from infancy or early childhood, or regressed to frustrating or inhibiting environmental pressures. Instinctual wishes and fears may falsify reality. Therefore, moral evaluations, expressions of good, evil, moral and immoral productions are regarded as products of the human mind and should be investigated as such. Influences of the environment must be studied in detail as to their practical reality. This is essential in seeking a scientific explanation, and comprehension of mental disturbances, and a rational therapeutic approach to emotional problems and the personality disorders.

Psychoanalysis divides mental life into conscious and unconscious mental activity. Conscious and unconscious mental activity may coexist, along with other properties, or consciousness may be absent as in dreams or hypnosis. No idea or thought is continuously or permanently conscious. Thinking, as we know it, would be impossible if such were the case. Our daily living experiences, recede into the background of our thinking and feeling. Under certain conditions, these can again become conscious, that is, may and can be recalled. Where such living experiences have had traumatic effects leading to serious emotional and personality difficulties, as we see most clearly in the neuroses and psychoses, certain opposing forces inherent in every personality come into play in the interest of maintaining the organization and adequate function of the personality. The problem of the nature of these opposing forces and their mode of operation, led Freud to the doctrine of repressions and resistances, the recognition of infantile sexuality, and the interpreting and making use of dreams as a source of knowledge of the unconscious. The knowledge of these mechanisms made possible the development of appropriate therapeutic technics.

In actual practice, the psychoanalyst follows the generally accepted methods of other types of medical practice in the preliminary investigation of the patient's troubles. The psychoanalyst is interested

in the patient's complaints, his symptoms, and the duration and history of their development. He is interested in the physical aspects of the presenting medical problem. He is particularly interested in the evidences of increased tensions and anxieties, overdetermined reactions to reality situations, and the effects of these on physiological functions, work habits, and social and personal relationships. Sometimes, special psychological tests, such as the intelligence and Rorschach tests are helpful in evaluating the individual. In other words, the physician brings to bear all his medical knowledge in his formulation of the problem and further plans for investigation and treatment.

As to the tools of the trade, the analytical couch, the special arrangement of the office, and positions of the therapist and patient in this setting, all have become quite familiar to the public through the cartoons and articles in daily papers, magazines, movies, and radio. The rationale, for this circumstance, however, needs elaboration. In psychoanalytic therapy we deal with conscious as well as unconscious material, events and problems of today as well as of yesterday and of the past. For this purpose, we frequently employ the technic of free association. The patient lies on the couch, and is instructed to say what comes to his mind without reservation. The analyst may sit behind the patient. These rules are not rigidly followed in all cases. The aim is to avoid distracting influences so as not to interfere with the stream of mental activity. This may include dreams, relating of present or past difficulties, with much that is reminiscent of and has the coloring of infantile and early childhood experiences. This is made possible through what is known as the transference, that is, the character of the patient's feelings toward the analyst, which enables him to portray and transfer earlier reaction patterns and feeling relationships into the analytical situation. These productions in the light of the patient's history and other material from previous interviews are used as a basis for interpreting to the patient the meaning and

nature of the psychological phenomena that constitute his symptoms. This serves to bring unconscious conflicts to the conscious level, where they may be dealt with realistically and more objectively. The aim is to bring about the release of old affects, and the giving up of immature attitudes and ways of dealing with life's problems.

In consideration of a patient for psychoanalytic therapy, the age, intelligence, and ability to cooperate are determining factors. In some cases, a preliminary period of psychoanalytically oriented psychotherapy, modified in the direction of conscious material is necessary. This is especially true in acute conditions such as severe anxiety and tension states, which may be prepsychotic. Much depends on the intelligence, training, skill, and resourcefulness of the physician. Other factors, such as the nature, and the severity of the condition, and the kind of fundamental personality structure from the standpoint of integration and organization determine what or how much can be achieved in any given case. In some cases psychoanalysis is not indicated, nor the therapy of choice. It is a long drawn out procedure, and expensive from the standpoint of both time and money. It should be undertaken only after thorough consideration by the patient and the physician, of all that long term therapy involves.

Research in psychoanalysis is by the laborious empirical method. The treatment room has definite limitations as a research laboratory. Current research interests are in the direction of shortening therapy in the neuroses, and developing better understanding of, and therapeutic technics in the psychoses. Progress has been and is slow. This is due not only to the limitations of the research methods as such, but to the difficulty of interesting and training qualified physicians for this purpose. The present demand for psychiatric treatment creates a considerable problem for the psychoanalytic training institutions in the country. The established institutes are only able partially to meet the demand, and new training centers are coming into exist-



ance. This puts the emphasis on training, and the development of training facilities. There is also a constant and increasing acceptance and utilization of psychoanalytical concepts and principles in nonmedical fields, such as social work, education, and industry. There, again, we have a constant and increasing demand for teaching and training in psychoanalytical psychology. While psychoanalytic concepts and principles are applicable to many fields of human endeavor, psychoanalytic therapy is solely the function of the physician trained in this specialty.

In conclusion, the study of patients by

the psychoanalytic method is that of investigating and evaluating the expressions and functions of the personality, in the light of the total background of living experiences and influences which have brought about the distortions and inhibitions in the development of the patient and the resultant disorder. By this means and the use of appropriate techniques, the patient may be brought to more normal functioning and a happier state of mind.

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## PUBLIC RELATIONS IN ORGANIZED MEDICINE

The code of the true physician through the ages has been to do the best he could and keep his mouth shut. The first part of the formula is as applicable now as ever. The second part has been altered by circumstances as definite as they are vital. When the doctor assisted by his limited tools and drugs was all that medicine offered, then only patient-doctor relations existed. Developments of the past century have introduced many factors that have a bearing on that relationship. Now we have patient relations and we have public relations.

The doctor now is merely the focal point

for a small, or possibly a sizable army of persons who work for health. The benefit of these efforts is bought at considerable cost. The physician's part of the total may be,—and usually is,—small. In the emotional adjustment the public makes, the expense is assigned to the doctor. In this, and in various other ways, the physician is not understood as he once was. The problem of proper understanding becomes one of education and adaptation. As we now realize, this is a situation which must be improved by the work of organized medicine, and also,—and more important,—by the individual physician.

Our organizations have come belatedly into this field; the success of their efforts has been a source of great encouragement. They were able to put medicine's situation in regard to the patient, and in relation to socialism, before the public through the usual channels of publicity. Among other things, they were able to inform the public in regard to the necessities and the expense of adequate medical education; the cost of hospital service; the reasons for licensing laws and for our code of ethics. The public can be brought to comprehend that medical ethics were developed and maintained in the best interests of the public, and were not the outgrowth of avarice and jealousy. It is essential that facts pertaining to these situations be presented many times over.

However, as valuable as this form of publicity has proved to be, the conduct of the individual physician is even more vital in providing proper public relations. The doctor must ever keep in mind that what he does or fails to do is reflected upon the entire profession. The public's only intimate contact with any part of the whole field of medicine is with his doctor. The whole is good or bad as it is felt through his doctor. When the contact is not pleasant, the patient reacts in his own defense by wanting to regulate, to sue, or to regiment medicine under a strong (or despotic) central government. One of the most important sources of unpleasant contact in doctor-patient relations is the matter of cost. Around



the question of cost many aspects of controversy and criticism have developed. More intimately in our individual contacts with patients, the commonest source of ill will is the matter of fees. Except under rigid direction, which would actually be socialized medicine, fees are not subject to control, and remain, therefore, a fertile source of conflict. When charges are not agreed upon, and a fee "out of line" is demanded, the patient feels resentment. Presenting this matter to the Courts it has been stated for our and other professions that fees are to be based upon the character of the service, the quality of the service, and the capacity of the patient to pay. In spite of this, we must remember what others have found,—that the customer is always right. As has been found many times over, if a physician would take into consideration the prevailing custom of his community this source of friction would be materially reduced.

Another source of concern is the availability of the physician. The public makes demands upon doctors in this respect that are not expected of any other quarter of the community. The quality of performance in the past has tended to establish this. When help is not within easy reach, dismay comes, and resentment is visited upon all doctors. Recognition of the importance of

availability has led to a system for handling emergency calls in various metropolitan areas. These arrangements are costly and difficult to administer, but they promote the kind of good will that will help against socialized medicine.

The particular field of relations with the daily press has received deserved attention in some states, and Colorado has achieved notable success in adjusting the situation to the interests of the editor and the physician. Attempts have not been made to suppress news unfavorable or otherwise. Physicians are made readily available to assist in securing facts, to interpret medical news, and to rationalize conflicts. The code of ethics in regard to press relations such as Colorado has arranged has served a fine purpose in avoiding the ill effects of sensationalism, which would tend to put organized medicine and the physician in an unfavorable light. Arrangements along these lines are recommended as a general policy for organized medicine, and contact of this order with the press is far better in its conception and operation than that which develops influence on the basis of a large advertising account. It is more fitting to the dignity and to the aims of the physician. Every contact the physician makes has a bearing on the public relations of organized medicine.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### ANNUAL MEETING

The committees on arrangements for the 1950 meeting to be held in Baton Rouge April 24-26, have been extremely active during the past few months in making plans for the convention this year. Dr. U. S. Hargrove, General Chairman, and all of his sub-chairmen have given a great deal of time and thought to arrangements for all phases of the meeting. Information has been received from the Chairman of the Committee on Hotels, Dr. Edward G. Cail-

leteau, that the hotels and tourist courts have indicated a desire to cooperate in offering suitable and adequate accommodations for our doctors and a card has been sent to each member for his use in requesting reservation. It is essential that these requests be received by Dr. Cailleteau without further delay as rooms will not be held much longer by the hotels and tourist courts. A sufficient number of rooms are tentatively being held. However, these will have to be released about six weeks prior to

the date of the meeting. Send your request immediately to Dr. Cailleateau, 916 National Bank Building, Baton Rouge.

Dr. William O. Vennard, Chairman of the Golf Committee has made arrangements to hold the golf tournament at the Baton Rouge Country Club. This will take place on April 24, 25 and 26.

Many requests have been received for scientific exhibit space and it is hoped that adequate arrangements can be made to take care of this important phase of the meeting.

The pharmaceutical companies, instrument houses and other businesses have cooperated by buying technical exhibit space and although space will be limited, it is felt that the display will prove most interesting and attractive to the doctors in attendance.

The scientific program is almost completed. Information will be carried in future issues of the Journal concerning the program and copy will be sent to each member two weeks prior to date of the meeting.

Be sure your plans for 1950 include attendance at the Annual Meeting.

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## TENURE AND OBLIGATIONS OF MEMBERSHIP

The House of Delegates of the American Medical Association at its meeting in Washington, D. C., December 6 to 8, 1949, adopted amendments to the By-Laws of the American Medical Association whereby Division One, Chapter II, Tenure of Membership, has been changed to read as follows:

Chapter II.—Tenure and Obligations of Membership; Dues:

Section 1.—When the Secretary is officially informed that a member is not in good standing in his component society, he shall remove the name of said member from the membership roll. A member shall hold his membership through the constituent association in the jurisdiction of which he practices. Should he remove his practice to another jurisdiction, he shall apply for membership through the constituent association in the jurisdiction to which he has moved his practice. Unless he has transferred his membership within six months

after such change of practice, the Secretary shall remove his name from the roster of members.

Sec. 2.—Annual dues, not to exceed \$25.00, may be prescribed for the ensuing calendar year in an amount recommended by the Board of Trustees and approved by the House of Delegates. Each active member shall pay said annual dues to his constituent association for transmittal to the Secretary of the AMA.

An active member who is delinquent in the payment of such dues for one year shall forfeit his active membership in the AMA if he fails to pay the delinquent dues within thirty days after notice of his delinquency has been mailed by the Secretary of the AMA to his last known address.

Any former member who has forfeited his membership because of being delinquent in payment of dues may be reinstated on payment of his indebtedness.

(d) The amended By-Laws provide for the collection of the AMA membership dues by the constituent associations for transmittal to the Secretary of the AMA. The detailed method to be adopted by each constituent association will vary in each state. In general, the method utilized by each state for the collection of its own component and constituent association dues should be followed.

It is planned to provide each member of the AMA a membership card and certificate of membership when his dues are paid.

It will be necessary for the Secretary of the AMA to notify those members who are delinquent in the payment of their dues, and this office will, therefore, require a complete list of all active dues paying members.

No changes have been made in the Constitution and By-Laws of the AMA with respect to Fellowship. Eligibility for Fellowship and annual Fellowship dues of \$12.00 remain the same. Under the present By-Laws, a Fellow will pay for the year 1950 total membership and Fellowship dues of \$37.00.



CANCER SEMINARS

Two hundred and thirty-one doctors from four of Louisiana's eight districts, attended the Cancer Seminars on January 4, 5 and 6, conducted by teams of doctors from the L. S. U. and Tulane Medical Schools. These meetings were sponsored by the Cancer Committee of the State Medical Society, working cooperatively with the Louisiana Division of the American Cancer Society and the Department of Health in this professional education program for Louisiana.

Reports show that the Seminars in the Third, Fourth, Fifth, Sixth and Seventh District received the commendation of all who were in attendance and that the splendid program of study elicited enthusiastic approval and interest, which will mean even better attendance at the next series of Cancer Seminars scheduled for early March, the exact date to be announced later.

The L. S. U. team, consisting of Dr. W. J. Burdette, Dr. Howard Mahorner, Dr. Louis Raider and Dr. J. H. McCormack, Jr., appeared in Shreveport at Charity Hospital on Thursday, January 5. Seventy-five doctors registered for the sessions held in the afternoon and evening, according to Dr. Charles L. Black, member of the Execu-

tive Committee of the Cancer Committee for the Fourth District.

The Fifth District meeting, held in Monroe on Friday, January 6, was attended by 50 doctors who met in the Virginia Hotel Ball Room for afternoon and evening sessions, after a round of wards and consultations at the Charity Hospital (Conway Memorial). Dr. Jack Rawls, of Bastrop, was chairman of arrangements.

The Tulane team, made up of Dr. Paul DeKamp, Dr. Charles Dunlap, Dr. Albert Segaloff, Dr. Joseph Schlosser and Dr. John Hunt, conducted a seminar at Baton Rouge on January 4, with 30 doctors present.

Dr. T. Jeff McHugh reports that in Lafayette on January 5, where Dr. L. O. Clark had set up arrangements at Lafayette Charity Hospital, there were 28 doctors present. At Lake Charles on January 6, in St. Patrick's Hospital, there were 48 doctors present, led by Dr. Walter O. Moss, Cancer Committee chairman for the district.

Members of the Medical Auxiliaries in each of the districts made a definite contribution by their handling of registration for these conferences.

LOUISIANA STATE MEDICAL SOCIETY NEWS  
C A L E N D A R  
PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

FIRST INTERNATIONAL CONGRESS ON  
DISEASES OF THE CHEST

The First International Congress on Diseases of the Chest will be held at the Carlo Forlanini Institute, Rome, Italy, September 17-20, 1950, under the auspices of the Council on International Affairs of the American College of Chest Physicians and the Carlo Forlanini Institute, with the patronage of the High Commissioner of Hygiene

and Health, Italy, in collaboration with the National Institute of Health and the Italian Federation Against Tuberculosis.

Physicians who are interested in attending the Congress should communicate at once with Dr. Chevalier L. Jackson, Chairman of the Council on International Affairs, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois, U. S. A., or with Professor A. Omodei Zorini, Carlo Forlanini Institute, Rome, Italy.

## LETTER TO THE EDITOR

August 30, 1949.

Dear Sir:

Would you publish the following request?

The study of twins is of great value in providing information concerning the respective importance of hereditary predisposition and environmental influences in disease in man. The results of the use of this method have shown a hereditary predisposition to tuberculosis, diabetes, and tumor formation, and a high, medium or low intelligence quotient.

There is some *a priori* evidence showing an hereditary predisposition for peptic ulcer. Only six cases of the occurrence of peptic ulcer in the one or both of mono- or dizygous twins have been reported in the readily accessible literature. Since twins are born in 1 of 86 births and identical twins in 1 of 344 births and the general incidence of ulcer is from 5 to 10 per cent there should be plenty of material available.

Physicians are asked to cooperate in assembling such material by sending me cases in which (1) or both twins develop peptic ulcer, (2) the site of the ulcer, (3) the age of onset of ulcer, (4) the type of twins (monovular or diovular), (5) the sex of the twins, (6) the date of birth of the twins, and (7) the number and age of the brothers and sisters and the absence or presence of ulcer in each.

A. C. Ivy, M. D.,  
Department of Clinical Science,  
University of Illinois,  
1853 West Polk Street,  
Chicago 12, Illinois.

### CONTINUATION COURSE IN OPHTHALMOLOGY

A Continuation Course in Ophthalmology will be held March 13, through noon March 18, 1950, given by the Department of Ophthalmology of Tulane University and the Division of Graduate Medicine. Guest lecturers will be: Dr. Daniel B. Kirby, New York, New York, Professor Emeritus of Ophthalmology, New York University Medical School; Dr. Frank B. Walsh, Baltimore, Maryland, Associate Professor of Ophthalmology, Johns Hopkins University and Wilmer Eye Institute; Dr. Robert J. Master, Indianapolis, Indiana, Professor of Ophthalmology, University of Indiana, Indianapolis, Indiana Medical School; Dr. Harold Falls, Ann Arbor, Michigan, Associate Professor of Ophthalmology, University of Michigan Medical School; and Dr. Charles Sheard, Distinguished Lecturer in Ophthalmology, Tulane University of Louisiana, Professor Emeritus of Experimental Biophysics, Graduate School, University of Minnesota (Mayo Clinic). Additional lectures will be given by resident faculty members of the Department of Ophthalmology, Tulane University.

### LOUISIANA SOCIETY OF ANESTHESIOLOGISTS

On November 25, 1949, the Louisiana Society of Anesthesiologists met at Charity Hospital in New Orleans for their annual meeting. An extremely interesting and informative talk was given by Dr. W. A. Sodeman of the Department of Medicine of Tulane University, on the subject of "The Cardiac Patient as a Surgical Risk" and there followed a period of discussion of the same subject. Following this, the Society held a business meeting at which the following officers were elected:

President, Dr. John Adriani of New Orleans; Vice-President, Dr. John W. McGehee of Baton Rouge; Secretary-Treasurer, Dr. A. J. Ochsner of New Orleans; Delegate, Dr. George B. Grant of New Orleans; Alternate Delegate, Dr. Stanley Mintz of Monroe, La.

### REVISED GETTYSBURG ADDRESS

One score and sixteen years ago our fathers brought forth upon this nation a new tax, conceived in desperation and dedicated to the proposition that all men are fair game.

Now we are engaged in a great mass of calculations, testing whether that taxpayer or any other taxpayer so confused and so impoverished can long endure. We are met on Form 1040. We have come to dedicate a large portion of our income to a final resting place with those men who here spent their lives that they may spend our money.

It is altogether anguish and torture that we should do this. But in the legal sense we cannot evade—we cannot cheat—we cannot underestimate this tax. The collectors, clever and sly, who computed here, have gone far beyond our power to add and subtract.

Our creditors will little note nor long remember what we pay here, but the Bureau of Internal Revenue can never forget what we report here. It is for us, the taxpayers, rather to be devoted here to the tax return which the government has thus far so nobly spent.

It is rather for us to be dedicated to the great task remaining before us, that from these vanishing dollars we take increased devotion to the few remaining; that we here highly resolve that next year will not find us in a higher income tax bracket.

That this taxpayer, underpaid, shall figure out more deductions; and that taxation of the people, by the Congress, for the government, shall not cause our solvency to perish.

Reprint from "The Carpenter"



## FELLOWSHIP IN PEDIATRICS

A recent intensive study of child health services has documented widespread feeling that there was greater need for better training programs in pediatrics for general practitioners than there was for more pediatricians. In hopes of helping to meet this need, the Division of Graduate Medicine and the Department of Pediatrics at Tulane Medical School in New Orleans have collaborated in establishing plans for continuous training fellowships in Pediatrics designed particularly to meet the needs for general practitioners from rural communities who have a major interest in problems peculiar to infants and children.

Applicants should be less than forty-five years of age, should have been out of medical school for less than ten years, and should have practiced and have planned to continue practicing in communities having less than ten thousand population. The course of study will continue over a period of not less than three months and will encompass practical clinical experience in all phases of infant and child health, active participation in the undergraduate and postgraduate teaching programs of the Department of Pediatrics, and opportunity for pursuit of individual clinical or research interests on a part-time basis. Appointments will be made on the basis of merit and need and the course of study will be highly individualized. Application can be made by any qualified individual, either directly or indirectly or through a sponsoring agency, such as county medical societies, maternal and child health divisions of state health departments, sections on General Practice or Rural Health of the American Medical Association, interested Foundations or civic groups etc.

Responsibility for arranging and paying for registration, tuition, and living expenses during the period of fellowship rests with the individual applicant or his sponsoring agency. For further information, interested individuals or agencies should correspond with the Director of Graduate Medicine, Tulane Medical School, 1430 Tulane Avenue, New Orleans, Louisiana.

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 EIGHTEENTH ANNUAL MEETING—  
SOUTHEASTERN SURGICAL CONGRESS

The eighteenth annual meeting of the Southeastern Surgical Congress will be held at the Shoreham Hotel in Washington, D. C., on March 6, 7, 8 and 9, 1950. A comprehensive and interesting program has been arranged. For further details, interested physicians may communicate with Dr. B. T. Beasley, Secretary of the Southeastern Surgical Congress, 701 Hurt Building, Atlanta 3, Georgia. The program is as follows:

## Guest Speakers

Dr. Otto C. Brantigan, Baltimore, Md.  
Extrapleural Plombage Using Lucite Balls in the Treatment of Pulmonary Tuberculosis

Dr. Enoch Callaway, LaGrange, Ga.  
Carcinoma of the Cervix

Dr. William C. Cantey, Columbia, S. C.  
Colostomy and Ileostomy

Dr. Bayard Carter, Durham, N. C.  
The Treatment of Squamous Celled Carcinoma of the Vulva

Dr. Richard Cattell, Boston, Mass.  
Management of Hyperthyroidism

Dr. Harry Lee Claud, Washington, D. C.  
Plastic Surgery of Interest to the General Surgeon

Dr. Conrad G. Collins, New Orleans, La.  
Benign Lesions of the Cervix

Dr. Donald S. Daniel, Richmond, Va.  
Endometriosis

Dr. Edgar W. Davis, Washington, D. C.  
Clinical Significance of Intrapulmonary Neoplasms

Dr. Gilbert F. Douglas, Birmingham, Ala.  
Uterine Bleeding, The Gynecologists Bete Noire

Dr. Frederick H. Falls, Chicago, Ill.  
The Management of Ectopic Pregnancy

Dr. Albert E. Goldstein, Baltimore, Md.  
Familial Urological Diseases

Dr. D. P. Hall, Louisville, Ky.  
The Spleen, A Few Surgical Aspects

Dr. William F. Harper, Selma, Ala.  
Nephropexy, Its Indications, Operative Technique and End Results

Dr. Archibald C. Hewes, Gulfport, Miss.  
Chest Conditions which Come Under Realm of General Surgery

Dr. Hal E. Houston, Murray, Ky.  
The Meckel's Diverticulum

Dr. Harry H. Kerr, Washington, D. C.  
Haemangio-Sarcoma of the Stomach

Dr. Lucien A. LeDoux, New Orleans, La.  
C. Jeff Miller: His Teachings in the Management of Uterine Fibroids.

Dr. Howard Mahorner, New Orleans, La.  
Explorations of the Common Bile Duct

Dr. J. D. Martin, Jr., Atlanta, Ga.  
The Complications of Splenectomies

Dr. Henry W. Mayo, Jr., Charleston, S. C.  
Present Status of the Surgical Therapy of Gastric and Duodenal Ulcer

Dr. Raymond W. McNealy, Chicago, Ill.  
The Management of Carotid Body Tumors

Dr. William F. Meacham, Nashville, Tenn.  
Surgical Treatment of Intra-Cranial Aneurysms

Dr. A. T. Miller, Jr., Chapel Hill, N. C.  
To be announced

Dr. Charles B. Olim, Memphis, Tenn.  
Experiences in the Surgical Treatment of Congenital Pulmonary Stenosis.

Dr. Louis M. Orr, Orlando, Fla.  
Carcinoma of the Urinary Bladder

Dr. Neal Owens, New Orleans, La.  
Some Further Considerations in the Treatment

of Surface Cancer  
 Dr. George T. Pack, New York, N. Y.  
 Recent Advances in the Treatment of Cancers of  
 the Esophagus and Stomach  
 Dr. Willard H. Parsons, Vicksburg, Miss.  
 Surgical Problems in the Aged Negro  
 Dr. J. C. Patterson, Cuthbert, Ga.  
 Gastrocolis Fistulae  
 Dr. William F. Rienhoff, Jr., Baltimore, Md.  
 Hyperparathyroidism Diagnosis and Surgical  
 Treatment  
 Dr. Charles Rountree, Oklahoma City, Okla.  
 The Use of Bone Bank Bone in Bone Surgery  
 Dr. Joseph S. Stewart, Miami, Fla.  
 Gastric Resections and Vagotomies, Morbidity  
 and Mortality in a General Hospital, not Asso-  
 ciated with a Teaching Center  
 Dr. Gabriel Tucker, Philadelphia, Pa.  
 Diagnosis and Treatment of Carcinoma of the  
 Larynx

Dr. William L. Valk, Kansas City, Kansas  
 Segmental Renal Functions Studies in Surgical  
 Patients  
 Dr. H. H. Ware, Jr.  
 Ectopic Pregnancy  
 Dr. Robert J. Wilkinson, Huntington, W. Va.  
 The Effect of Medical Education Upon Our  
 Economic Future  
 Dr. Charles Stanley White, Washington, D. C.  
 Sigmoido-vesical Fistula: Diagnosis and  
 Treatment  
 Dr. William Crawford White, New York, N. Y.  
 Radical Operations of Cancer of the Breast  
 Dr. Hays R. Yandell, Tulsa, Okla.  
 The Treatment of Extensive Burns  
 Dr. George H. Yeager, Baltimore, Md.  
 Treatment of Mixed Peritonitis with  
 Aureomycin

## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

### WOMAN'S AUXILIARY, LOUISIANA STATE MEDICAL SOCIETY

In 1949, for the first time, the Women's Auxiliary to the Orleans Parish Medical Society honored two of its members for their long and signal service to the group by conferring honorary membership on them for two years. Again this year, two more outstanding women have been elected to this honor for two years, namely, Mrs. S. Chaille Jamison and Mrs. John H. Musser. Mrs. Jamison served the Auxiliary as its president in 1934-35. Mrs. Musser was president of the Louisiana State Auxiliary in 1933-34. At the February meeting of the Orleans Parish Auxiliary, these members were presented certificates of honorary membership by the president, Mrs. Boni De Laoreal, in appropriate ceremonies. Honor guests also at this meeting were the members of the Executive Board of the Auxiliary to the New Orleans Dental Association.

The Periodic Health Chairman has mailed cards to the entire membership urging an annual medical check-up.

Plans are being formulated by the Orleans Parish Auxiliary for the entertainment of the wives of doctors attending the New Orleans Graduate Medical assembly. The assembly will be held in New Orleans March 6-9.

An essay contest is being sponsored by the Auxiliary in the Orleans Parish schools—both private, parochial and public. The topic is "Why the Private Practice of Medicine Furnishes This Country With With the Finest Medical Care." The prizes total \$100. The judges consist of a committee of

prominent medical and lay people, men and women. Mrs. Edwin R. Guidry is chairman of the essay contest.

The Woman's Auxiliary to Rapides Parish Medical Society is also sponsoring an essay contest, the purpose of which is to make "Today's Health" (the new name of Hygeia) better known to laymen. The title of the essay is "Improving Health Through Today's Health." The contest will be held the week of March 26, and will be open to high school students of both public and parochial, white and colored, schools of Alexandria. Prizes of \$30 for the white students and \$30 for the colored will be given. Mrs. Noel Simmonds is chairman of the essay contest.

Subscriptions to Hygeia have been given to the colored high schools of Alexandria. The white schools have been subscribing for some time.

At the February meeting, the Rapides Parish Auxiliary elected the following officers for the year 1950-51: President, Mrs. H. H. Hardy, Jr.; President-Elect, Mrs. Henry Gahagan; Vice-President, Mrs. Noel Simmonds; Recording Secretary, Mrs. C. E. Hensel; Corresponding Secretary, Mrs. R. B. Wallace, Jr.; Treasurer, Mrs. R. J. Freedman; Historian, Mrs. Clarence Pierson; Parliamentarian, Mrs. Allen C. Winters.

Dr. Alice Williams, of Church Point, was guest speaker at the January meeting of the Woman's Auxiliary to the Lafayette Medical Society. Dr. Williams, who spoke on "Public Relations," gave many suggestions from a physician's viewpoint, as to the ways the Medical Auxiliary may be of service to the physician and to the community.



Dr. Williams also stressed that it was important for the Auxiliary to support such organizations as the American Cancer and Heart Associations.

The Woman's Auxiliary to the East Baton Rouge Parish Medical Society celebrated its 10th anniversary at the January meeting. Honored guests were the nine past presidents and Mrs. Roy Carl Young, through whose efforts the Auxiliary was founded. Mrs. Young is a past-president of the Louisiana State Auxiliary.

At the January meeting of the Woman's Auxiliary to the Tangipahoa Parish Medical Society, a report was made on the gifts of hard candy which had been given to the children's ward of the Florida Parishes hospital. Miss Velmarae Dunn gave an interesting book review on "The Siamese Doctor" by Jacques M. May.

A book review was also given on the programs of the Woman's Auxiliary to the St. Tammany Parish Medical Society and the Woman's Auxiliary to the Jefferson Davis Parish Medical Society at their January meetings.

Mrs. P. A. Donaldson, Councilor of the Second District of the State Auxiliary has been making plans for talks to be given by physicians on Nursing, Periodic Health, and Polio.

Mrs. Donaldson entertained members of the First and Second Districts at a tea and sherry party at home in Reserve in February.

The Woman's Auxiliary to the Ouachita Parish Medical Society entertained the Louisiana Nurses Association at a tea in November at the Lotus Club of Monroe.

The Publicity Committee of the Woman's Auxiliary to the Shreveport Medical Society has formulated an admirable policy in regard to newspaper publicity. The committee, of which Mrs. Harold J. Quinn is the chairman, thinks that the more serious side of the Auxiliary should be pre-

sented to the public. Emphasis has been placed on the various projects of the social hour following the programs. All publicity is written with the aim of projecting the Auxiliary as a serious Women's organization rather than a social club of doctors' wives.

An active and interesting Committee of the Woman's Auxiliary to the Shreveport Medical Society is the Speakers' Bureau. The latter was organized in March, 1949, by Mrs. J. T. Heard, then president of the Auxiliary. The purpose of the Speakers' Bureau was to bring to the club women of Shreveport facts pertaining to socialized medicine. Mrs. Charles E. Rew was appointed chairman of the committee which consisted of Mesdames Eugene Wenk, Ben Cobb, Irvine Rice, B. P. Smith and O. C. Rigby. The speakers who served the bureau were Dr. Alice Holubeck, Mrs. A. A. Herold and Mrs. J. Bender.

The committee contacted all women's clubs in Shreveport — literary, civic, political, patriotic, sororities, study clubs, music and religious—to arrange for a member of the Speakers' Bureau to address the club on socialized medicine. Twenty-nine clubs were served, and the audiences were most appreciative. They expressed the feeling that their viewpoint had been broadened and that the whole subject was better understood as a result of the information given them.

The Parent-Teacher Associations were not able to arrange for speakers because their programs had already been planned for the remainder of the school term. In September, the committee contacted 21 presidents of PTA units to arrange for speakers during the 1949-50 year. To date eight PTA units have heard an address by a member of the speakers' bureau and before the end of the school year, all units will have been visited.

MRS. DANIEL M. KINGSLEY  
Chairman Press and Publicity.

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## BOOK REVIEWS

*Neoplasms of Bone and Related Conditions: Their etiology, pathogenesis, diagnosis, and treatment:*

By Bradley L. Coley, M. D., New York, Paul B. Hoeber, Inc., 1949. Pp. 765 illus. tables. Price, \$17.50.

This timely book is one of the greatest contributions to the relatively neglected field of oncology. The material is presented with primary emphasis on the clinical aspects of neoplastic diseases of bone stressing differential diagnosis and measures necessary for the establishment of correct diagnosis; the various methods and technics of therapy, plus a thorough evaluation of the results of the treatment. A number of non-neoplastic diseases of

bone have been included in the discussion of differential diagnosis of bone tumors which increases the value of the clinical evaluation of neoplastic diseases immeasurably.

It is quite fitting that the author, stimulated and proctored by his father, a pioneer in the field of oncology, and with years of vast clinical experience at one of the largest centers devoted to the diagnosis and treatment of neoplasia, should attempt such a monumental task of compiling the vast amount of material contained in this book. It will take its rightful place as the authoritative text on bone neoplasia and should be included in the library of not only oncologists, surgeons, and

diagnosticians, but should be available to every practitioner of medicine as a reference and aid in the diagnosis of neoplastic diseases of bone.

JACK WICKSTROM, M. D.

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*Essentials of Gynecologic Endocrinology:* By Gardner M. Riley, Ph. D. Ann Arbor, Mich., Caduceus Press, 1948. Pp. 205. Price, \$3.00.

This presentation of the fundamentals of reproductive physiology, the endocrine aspects of gynecological dysfunction or clinical usage and details of useful diagnostic procedure is based in large part upon lectures and discussions prepared for the Gynecology Endocrine Conferences of the University of Michigan Medical School.

In so many of the texts on endocrinology, one becomes immediately lost in the maze of inconclusive animal experimentation. Riley has chosen, wherever possible, to present the endocrine facts as they obtain in the human.

Chapters on endocrinology of the male, hormones and cancer, and a list of endocrine preparations add to the value of this booklet.

EUGENE H. COUNTESS, M. D.

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*The Eye and Its Disease:* By Conrad Berens M. D., F. A. C. S. Philadelphia, Wm. B. Saunders, Co., 1949. Pp. 1092, illus. Price, \$16.00.

The second edition bridges a thirteen year gap in American ophthalmic literature, during which time no textbook of intermediate size has been published. Advances in ophthalmology as recent as one year have been included in the text. Ninety-two authors, approximately 10 per cent of whom are foreign, have each contributed to that portion of the book dealing with the fields in which they are most noted. The large number of contributing authors of necessity reduces the continuity and cohesiveness found in texts written by one person, although this does not detract from the value of the book. The documentation of each chapter has largely been left to the discretion of the contributing authors, and varies rather widely.

The subject matter is divided into 14 sections and 76 chapters, many of which might well have been combined. Brevity of the table of contents has been compensated for by the addition of an unusually extensive alphabetic index. Excellent black and white photographs and sketches are profusely distributed throughout the book. The new double column type method of setting has been utilized to facilitate more rapid reading. Particularly noteworthy are the chapters dealing with orthoptic training, physiology of the eye, disease of the conjunctiva, and general and local therapy. Organized orthoptic training is a relatively new phase of ophthalmology and has not been empha-

sized in the older text books. The importance of anomalous retinal correspondence in the treatment of strabismus is recognized. In the chapter on physiology, Cogan's excellent work on the pathogenesis of corneal edema and aqueous formation is described in detail. In the section on disease of the conjunctiva, Thygeson emphasizes the necessity of bacteriologic studies in making accurate, clinical diagnoses. Viral and allergic diseases are elevated to their newly recognized positions of importance. The uses of newer drugs and methods are presented with clarity. Among these are the antibiotics, wetting agents, lubricants used to compensate for deficiency in lacrimal secretion, and physiotherapeutic agents including x-ray and radium. No mention is made, however, of radium G (Beta irradiation) which has recently been popularized largely by Ilig.

Although this volume may not supplant more extensive foreign publications, it probably will be used predominantly as a textbook especially for basic students. This edition should be in every ophthalmic library.

CHAS. A. BAHN, M. D.

GUS C. BAHN, M. D.

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*Clinical Case-Taking Guides for the Study of Patients:* By George R. Herrmann, M. D., Ph. D. 4th ed. St. Louis, C. V. Mosby Co., 1949. Pp. 240, illus. Price, \$3.50.

To quote from the preface, this book is "a guide for the study of patients, a semiology of disease processes, a treatise on the art and science of securing a meaningful story of the patient's symptoms and a systematic examination for the signs of disease."

This well known book is now in its fourth edition. A method of interviewing patients, in order to establish what sort of human being each one is, has been added, in the general outline, for all types of cases. The significance of personality functions as motivating factors in psychosomatic disorders has been pointed out. Sections on pediatric practice and surgical case study have been added.

This book shows how to establish scientific methods and systematic mental habits in taking complete and careful histories.

I. L. ROBBINS, M. D.

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*Business Side of Medical Practice:* By Theodore Wiprud. 2d ed. Philadelphia, W. B. Saunders Co. Pp. 232 illus. Price, \$3.50.

The author of this little volume is the Executive Director of the Medical Society of the District of Columbia. Chapters of especial interest are those



cn Office Management, Financial records, Case records and filing, Handling of Patients' Accounts, Doctor in Court, Investments and Insurance. Suggestions included are practical and time concerning matters on which many physicians have little information. Young physicians in particular, would find this volume most useful and informative.

MARY LOUISE MARSHALL.

*Fundamentals of Otolaryngology:* By Lawrence R. Boies, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp 443, illus. Price, \$6.50.

This textbook of ear, nose and throat diseases is written by nine authors and is not only designed to meet the needs of the medical student, but also to provide fundamental information to the physician who is not an otolaryngologist. Nevertheless, it would be an excellent review for any physician interested in this subject.

The book is divided into three parts; ear, nose and throat and contains twenty-two chapters. The last chapter is devoted to prescriptions and therapeutic procedures; themotherapeutic, antibiotic and other recent drugs, and is of most practical value to the student and the physician in the management of otolaryngologic problems.

The subject matter represents the opinion of today that has a factual basis and no attempt is made to describe in detail diseases that require a high degree of special training to recognize; nor to outline minutely such surgical procedures which otherwise concern the specially trained specialist and rightly so, since the book is obviously not meant for the expert otolaryngologist.

Each one of the three sections is preceded by a brief surgical anatomic review and offers a concise but comprehensive discussion of the causation, diagnosis, pathology, treatment and complications of the common diseases affecting the ear, nose and throat. More space is devoted to important subjects and less to rare or less important subjects. The book is rather conclusive and many of the recent advances in hearing tests and other functional tests, hearing aids, the esophageal voice after laryngectomy, speech training, and fenestration operation etc., are included.

The references at the end of each chapter are offered as a guide to the reader whose interest carries him to greater inquiry and they will be found to be adequate.

W. A. WAGNER, M. D.

*Urological Aspects of Spinal Cord Injuries:* By George C. Prather, M. D. Springfield, Ill., Chas. C. Thomas, 1949. Pp. 146. Price, \$3.75.

This monograph includes the modern concepts of normal bladder physiology, the changes in the bladder, sexual organs and upper urinary tract after spinal cord injury and the various types of treatment with their results after injury and during the period of recovery. A chapter is devoted to military policy and one to summarizing a suggested program for treatment.

The extensive studies and experience of Dr. Prather enables him to handle the subject in a masterly fashion. In addition, he describes the treatment used by others in the past and compares their results with those of modern methods.

The handling of impaired bladder physiology is thoroughly covered. The author does not believe that resection of the bladder neck is indicated as often as do Thompson, Emmett, and Bumpus. He also stresses the use of cystometrograms.

The treatment of complications in the kidney and lower urinary tract is discussed.

The illustrations are good and adequate, the material is well organized, the style is clear, concise and flowing and the bibliography is extensive.

This volume will be of great value to urologists, neurosurgeons and all who are interested in the handling of a poorly understood and sadly neglected subject.

JOHN G. MENVILLE, M. D.

#### PUBLICATIONS RECEIVED

Lear Publishers, New York, N. Y.: The Salt-Free Diet Cook Book by Emil G. Conason, M. D., and Ella Metz, Dietitian.

W. B. Saunders Company, Philadelphia: Diseases of the Foot by Emil D. W. Hauser, M. S., M. D. (Second Edition): Textbook of Pediatrics by Waldo E. Nelson, M. D. (Fifth Edition).

The Williams & Wilkins Company, Baltimore, Md.: Principles & Practice of Plastic Surgery by Arthur Joseph Barsky, M. D., D. D. S.

Paul B. Hoeber, Inc., New York: Quinidine in Disorders of the Heart by Harry Gold, M. D.; Brucellosis (Undulant Fever) by Harold J. Harris, M. D. (Second Edition).

Charles C. Thomas, Publisher, Springfield, Illinois: Practical Neurological Diagnosis by R. Glen Spurling, M. D. (Fourth Edition).

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## HYPERTENSION AND ITS THERAPY\*

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Hypertension is today's fancied-up synonym for *high blood pressure*. The latter term came into medical use in the early 1900's when the first attempts were made to utilize clinically the blood pressure measuring devices invented by the physiologists *circa* 1850. Hypertension is not a disease, even though some health authorities permit its inscription as a cause of death. It appears as a sign or symptom of disease,—but it is never anything more, clinically.

To interest you in the argument I am about to present, let me make some categorical statements:

1. What goes as, or with hypertension, now constitutes 60 per cent of all the things called the causes for death in man.

2. Hypertension is never consequent upon kidney disease (the so-called chronic interstitial nephritis of Richard Bright, today redubbed nephrosis).

3. The arterial compression instruments employed today to measure hypertension do not measure as much of an increased intravascular blood pressure as of a mere increase in the stiffness of the blood vessel walls at the place of measurement.

4. Hypertension thus comes to be a sign chiefly of blood vessel disease (commonly

called arteriosclerosis, better called atherosclerosis, and best of all made synonym for the arterio-capillary-venous fibrosis of (Gull and Sutton).

### WHAT MAY BE THE ORIGIN OF HYPERTENSION?

The high-priced books I carry on my shelves tell various stories: The Germans say that "arteriosclerosis is a constitutional disease"; the French, that "the arterial lesions in alcoholism may be taken as a type even though plumbism, gout, diabetes, old age, toxins, and the vegetable or mineral poisons may give rise to them." The British believe that "arteriosclerosis is the product of our high pressure life and too much alcohol, work and worry." With this the Americans agree, adding that "arteriosclerosis is the product of hypertension and/or results from a too rich protein diet." The volumes open and close with no defined statement of what might bring about vascular disease, thus leaving the practitioner to a therapy only ameliorative.

To put it flatly, no kind of systemic intoxication, however bad for the vascularly afflicted, has anything at all to do with its initiation. The recited elements (including "heredity") would bring down upon the victim a blood vessel breakdown *generalized* in character; actually it is always *local* in type.

To teach this fundamental principle of pathology I call the attention of my students to a cartoon in which a doctor is facing an old man with a bandaged right foot. "The pain in your foot is the consequence of your age," says the doctor; and the pa-

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tient answers: "Nonsense, my left is just as old and it does not hurt me."

Localized disease springs solely from localized cause,—inheritance, old age, alcoholism, and every other form of systematic intoxication cannot therefore be responsible. Had the old man's foot been tread upon, that could be the explanation; but in the absence of trauma, only one pathological mechanism remains to affect one side of a body and not its opposite; or one spot only in any uniform tissue and not the rest. This is the appearance of a locally active insultant,—origin of which we know only as the product of microorganismal life sown into that part.

Vascular disease has never been produced experimentally through any kind of *general* intoxication; it succeeds only upon the distribution of proper microorganisms into the tissues of the host via the blood stream.

Hypertension has been debated as the *cause* of blood vessel disease, when as we shall see, it is invariably its *consequence*. To produce hypertension, Nerking and Steinbiss, in 1908, fed protein to herbivora. Their systemic blood pressures fairly doubled. Finding their animals on necropsy to evidence blood vessel changes, the authors reasoned that the latter were consequent upon the former. Van Leersum repeated these experiments in 1911, but even though he kept his rabbits in hypertensive state for months, he found them sound in their blood vessels. The former idea was long leaned upon as truth in the U. S. A. Really to understand what happened requires recollection of the fact that blood pressure always rises with increase in the daily protein ration. Western civilization steadily records a blood pressure fifteen points higher than that of the Orientals whom circumstance compels to live mostly on herbaceous food. Laboratory animals (like all the domesticated and the caged in our zoos) are notoriously badly fed (not because of wish but because of stupidity and lack of funds). Relative or absolute starvation is soundest ground for the implantation of infection, and it is the infec-

tion and not the hypertension that gives rise to the pathological consequences visible in blood vessel disease.

As Gull and Sutton said, the pathology of arterio-capillary-venous sclerosis starts in the capillaries; thereafter, if those constituting the vasa vasorum become involved, not only the arteries but the veins too are struck. Recall that the lesions of atherosclerosis are invariably discrete. Lay open an affected vessel (like an aorta) and observe that between the obviously sickened patches there appears an entirely normal blood vessel wall structure. Never is the whole of an intima, a media, or an adventitia affected. This would be the case if a "poison" dissolved in the blood were responsible; but even when the lesions of blood vessel disease go to the extreme of "pipe stem" arteries, they still remain spotty in character. The pathological process begins in capillaries which as it involves the capillary blood supply to the walls of both arteries and veins, leads to their destruction.

Anatomical change starts in (1) *embolism* with micro-organisms, consequent upon which is (2) an *anemia* of the part supplied. The situation is usually recovered from, but if not (3) *anemic infarction* follows, characterized by (4) *degeneration*, and when sufficiently severe, (5) *necrosis*. The process may be accompanied by (6) *hemorrhage*, (7) *absorption* and/or (8) *scar formation* (replacement by connective tissue either with or without calcification).

#### WHAT IS THE PATHOLOGY OF VASCULAR DISEASE?

The concept of blood vessel disease as the consequence of infectious embolism of the vasa vasorum may be said to have started with O. Huebner in 1874. Besides pointing to arteriosclerotic changes observable in the brains of his syphilitics, he indicated that the lesions (1) appeared in the nutrient vessels of the larger blood vessels, (2) that they became involved first in their middle coat and not in the intima or adventitia. Since his day the etiology of atherosclerosis stands divided between that due to syphilis (not more than 10 per cent)

and all the rest. This rest has been declared the product of senility, degeneration, and the other items cited,—everything, in other words, except the real agent which is metastatic infection by other kinds of micro-organisms. To be specific, the current type of hypertension with its complications, when not due to the spirochete, is due to a streptococcus (and, or a staphylococcus or any other type of organism implantable in the vasa vasorum).

In 1912 Manouélin observed the lesions of blood vessel disease in 85 per cent of his rabbits after their intravenous injection with *killed* streptococci and staphylococci. Better evidence of the infectious and embolic origin of vascular disease has come since. Besides joint, muscular, and nervous lesions, Hartzell and Henrici described the appearance of vascular plaques in rabbits injected with the scrapings from infected teeth. Benson observed atherosclerotic lesions in the aortae of rabbits after their injection with the *streptococcus viridans* recovered from a human instance of coronary disease. E. R. Le Count and Leila Jackson saw the picture of chronic interstitial nephritis repeated in animals through the intravenous injection of streptococci. George Dick generalized on the problem when he discovered that the strains of organisms recovered from human instances of nephritis localized in the kidneys of experimental animals upon intravenous injection. We owe to N. W. Jones the finding of micro-organisms in thickened coronaries and the experimental consequence of the implantation of these organisms into the teeth of dogs. They lived miserably for years, to die in the end of vascular disease and its complications.

#### HOW DIAGNOSE BLOOD VESSEL DISEASE?

It rests upon two items: (1) sclerosis apparent in arteries and/or veins; (2) systemic blood pressure increase. Many other items are recited as diagnostic of the clinical situation but they should be seen for what they are,—pathological *consequences* of vascular diseases. (Here it should be noted that a “normal” blood pressure in

man is not 100 plus the age of the patient but, in adult life, always something within a few points of 125 over 85. A man of fifty with a systolic blood pressure of 150 requires recheck).

Hypertension (except as seen in the muscularly active, and therefore, the young) has origin in only one of three possible springs. Dismiss a paralysis of the carotid sinus as clinically improbable. This leaves two. In the resting patient, increase in systemic blood pressure appears only (1) when the intracranial pressure is increased; (2) when the blood vessel bed is diseased. The latter is what is under discussion.

The increased blood pressure observable in vascular disease is not due to roughening of the blood vessel walls (the internal friction of a liquid depends upon itself, not upon the character of the tube which it wets and through which it passes). More primary is a decrease in caliber of the blood vessels due either to (1) scarring, (2) spasm. This narrowing requires that the heart work harder to keep up adequate circulation and explains why the heart hypertrophies.

Of greatest importance next is to see that the compression methods used clinically do not so much measure this dynamic source of rise in blood pressure but more definitely its static—the *increase in the stiffness of the blood vessel walls*. As Clyde Brooks demonstrated *circa* 1915, hypertensives may show *no* increase in intravascular blood pressure at all when measured *directly*, (as by puncture of an artery with a hollow needle connected with a manometer). The more commonly employed clinical devices do not, therefore, measure increased intravascular pressure as much as they measure the resistance to compression of the walls of the blood vessels. It is on such account only that the blood pressure on one side of the body is read off as greater than that of the opposite; the intravascular pressure is the same in both but not the stiffness of the tubes carrying the blood.

It is only through the maintenance of a



normal or a heightened intravascular blood pressure that the vascularly diseased keeps alive. When in unaided circumstances (as though the progress of his disease) it *falls*, the patient does not improve but grows worse. He becomes a "heart case" and dies of decompensation. Digitalis and strophanthus, help him but not because they *lower* his blood pressure but because through action on a failing heart, they *increase* it! Cardiac hypertrophy is not a constant in vascular disease; even as it is present in all laborers, trainees, and leaking heart valves. This is a roundabout way of saying that all the alleged signs of vascular disease besides the obvious changes in the blood vessels and the hypertension are really only its consequences.

#### WHAT INVALIDS THE HYPERTENSIVE?

The picture is that of a rotting tree, withering unequally in its branches. The "old" man is the commonest picture of the still ambulatory victim of chronic and progressive vascular disease. He dodders not only motorially but mentally, has albumin in his urine, complains of failing eyesight, cannot make the hill any more, and goes to sleep over his newspaper. Infarction has cut one spot after another out of his (1) brain, his (2) eye, his (3) kidney. Because of item (2) he is declared the victim of an "albuminuric retinitis" unless the whole of the eyeball is deprived of circulation, when the diagnosis becomes glaucoma. Small and recurring infarctions of item (3) underlie Bright's disease (the primarily sclerosed kidney with its few casts, little albumin, and normal water output, because plenty of kidney substance is left for efficient kidney physiology). When vascular disease involves the nutrient streams into the walls of the larger blood vessels a more major insult to the blood supply of a whole member may come about: the (4) "gangrenes" of toes, feet, and legs. Multiple small infarctions thus affect the (5) heart. The product may be an "atrophy" of the heart muscle mass ("brown atrophy," and identical pathologically with chronic interstitial nephritis or a shrinking brain and spin-

al cord) or mark the origin of an angina. This is a state of pain induced through lack of oxygen and the resultant "cramping" of the heart. Maintained contraction in any muscle mass, including the involuntaries, is accompanied by pain. This mechanism underlies (6) intermittent claudication. Well to see finally, that the progressive "degeneration" described above may affect the physiology of any other tissue or organ not already mentioned. Degeneration of the islands of Langerhans in the pancreas consequent upon blood vessel disease and a resultant (7) diabetes mellitus is perhaps the most striking example.

#### WHAT KILLS THE HYPERTENSIVE?

A third of them die of intercurrent disease or accident. The remainder perish in equal number by (1) the heart route, (2) the head route. Primary death due to kidney failure scarcely exists. (The oliguric albuminurias observed in the terminal hours of the hypertensive, are due to cardiac failure, and the superimposition of the generalized nephritis caused hereby, upon the more disseminated spots of insult which appeared earlier in consequence of the capillary occlusions characteristic of the initiation of blood vessel disease of grosser form.) Exitus through circulatory breakdown should be seen for what it is,—the product of repeated and weakening infarctions of the heart muscle mass. When small, they require years ordinarily before decompensation comes into view but only seconds when coarser insult is given by larger scaled occlusions, as in coronary disease. Death in coma is usually laid to uremic poisoning. This it never is, for complete destruction of all kidney function is never followed by stupor, coma, and convulsions, alleged in the clinic to be the signs of "uremia." Then what are they? Uremia at bedside designation is an anemia and an edema of the brain induced in the vascular case through a gradual or more sudden interference with the through-flow of blood.

#### HOW TREAT BLOOD VESSEL DISEASE?

The matter divides, naturally, into measures palliative and those curative. Under

the former head, the aim is to (1) stop constricting action; (2) favor the vasodilative. Both nature and the drugs can be drawn upon for help. Vascular stiffness due to scarring and the deposition of calcium salts is usually dismissed as beyond therapeutic help. But whatever remains of tonus in the musculature of the arteries and veins is not. Worry, everywhere expressing itself in increase of muscular tone, involves the blood vessels too. But it is silly to think that the intelligent, who alone worry, will cease firing on mere command. Increase in body acid increases vascular tone—which explains why hard work and cold are not to be recommended. Coffee, adrenalin, digitalis, and strophanthus behave similarly. But their proscription calls for common sense. The increase in cardiac efficiency brought about by digitalis, for example, needs to be balanced against its vasoconstrictor effects.

To favor vasodilatation physiologically requires that the human organism live quietly in warm, fresh air. Thus far God has always been better at its provision than the ventilating engineers. In desperate moments (as in angina pectoris or intermittent claudication) the nitrites, and nitroglycerin help. Their quick action is not long lasting; wherefore, I suggest the addition of tincture of lobelia to prolong relief.

Eleeding sometimes helps, especially the circulatorily "embarrassed." It should not be practiced in the obviously anemic. Other things the same, blood pressure is the product of a relation—the quantity of the blood against the capacity of the blood tree. Either too much blood or too little space yields hypertension. Wherefore the loss of a pint of blood or two even, by the otherwise physically fit, may be followed by an agreeable (and fairly lasting) sense of relief.

But none of these things "cure." This is because they do not touch first cause. This lies in disease of the vascular tree, the product of repeated embolic infections infarcting the coats (the media chiefly) of the larger blood vessels.

Not more than 10 per cent of the hypertensives are syphilitic. The rest are infected by other microorganisms; they are not the subjects of heredity, emotional instability, worry, whiskey or hard work. Substitute the name of any pathologically effective organism for that of syphilis and a clear concept is obtained of all that is and all that complicates "hypertension."

The streptococcus is the favorite. And where might it be coming from? Both it (to produce the peripheral degenerations) and its toxins (to produce the generalized tonal increase) derive from first foci of infection. In 99 per cent of the clinical instances they lie in the teeth. Hypertension appears in children when the tonsils must be looked to, but as generally viewed, it is a disease of adults, and of such, beginning after forty-five. The moment corresponds with the time at which the subjects (usually tonsillectomized in childhood) no longer "resist" the infection in and about their teeth started mayhap in their teens. The noxious organism breaks into the general circulation and is swept by it into the peripheral tissues and deposited there. When these are the walls of the blood tubes, vascular disease is the outcome and it is its manifestations in the particular organ involved that draws the clinical picture. To reduce hypertension and to arrest progress in vascular disease, if not more can be accomplished, require therefore attention to the teeth of the hypertensive.

Proper judgment must be passed upon what appears in a mouth. Inclination is to refer diagnosis to the dental colleagues. It is better to do the job yourself. But do not go in immediately for x-rays, for your eyes and fingers are better tools. Carious, discolored, heavily filled, crowned, pegged, eroded, hypersensitive or hyposensitive, dead and pyorrheic or sclerosed teeth are all suspect. Use x-rays to substantiate your physical findings and to expose lesion hidden from the naked eye.

What happens to teeth is covered in the names of two pathologic processes—osteitis and/or arthritis (gingivitis). The situation commands that all efforts at surgical



attack upon the teeth and/or their housings be guided by the laws of the orthopedist. The dental surgeons but rarely accept this generalization. It compels our profession to reassume its obligations as "physicians and surgeons." The doctor of medicine, in other words, must take up a job which the dental surgeon will not. Little can be done medically for chronic foci of infection whether implanted in the teeth or elsewhere. They require surgical eradication, which means not only the removal of offending teeth but of the areas of infection found in the alveolar processes surrounding them. The latter belong to the teeth, rise with them, and are absorbed physiologically when they fall. The surgeon who amputates them at the time of an extraction aids nature.

The story has a happy ending. Properly executed, dental surgery removes almost at once a source of constitutional poisoning responsible for the too high "tone" of the blood vessels of the hypertensive. But do not tell the patient that you expect more—even though you will get it. The level to which hypertension can fall depends upon two factors: the reversible of muscle spasm and the not-so-reversible of organic change (fibrosis, calcification). Proper mouth surgery usually yields not only arrest of progress in disease but within limits, appreciable restoration.

#### CLOSE

I have talked to you as general men in medicine, of the commonest of man's diseases. The hypertensive with vascular breakdown requires for his care the intelligence of a doctor and not that of many specialists, for his illness is not that of days but of decades. Sir James Mackenzie left country practice for the floors of a city hospital, only to return to the country,— to observe and to treat better the beginnings of those diseases which in the end kill.

#### DISCUSSION

1. Question: What is the familial hypertension theory?

Answer: The belief that it is an inherited form of disease, and that nothing can be done about it. The same argument is applied to diabetes, insanity,

blood, heart and kidney disease, and a dozen more. It is easier to understand the state of these patients on the basis of infection than of familial type. No one is surprised to find two or three children out of five or six in a family affected with scarlet fever or poliomyelitis, yet when the infection is of more chronic type, the blue sky is called upon for explanation. As often as not, grandmother's kiss starts the babe into the disasters of its own old age.

2. Question: How long does it take an emotional spasm or constriction of blood vessels to become fixed to produce hypertension irreversible?

Answer: Spasm of the blood vessels is a vasomotor reaction initiated in the upper portion of the spinal cord and the basal nuclei. Their connection with the cerebral cortex allows the "mind" to have an effect on the general blood pressure. The hypertension resulting therefrom never becomes fixed. The fixed types of hypertension are due to fixed stiffenings of the walls of the blood vessel due to scarring and calcium deposition.

3. Question: How about sodium chloride restriction therapy?

Answer: No matter where practiced or on what disease, it is wrong in principle and hurtful to the subject. It was initiated by Fernand Vidal in the early 1900's for the reduction of edema. Within the last decade or two it has found employment for the reduction of high blood pressure. This it does; by half killing the patient. Sodium chloride restriction destroys the appetite and the patient, therefore, sinks into the class of the protein-starved. This is what the Europeans have been getting for nothing and is identical with what is war-edema. As stated a moment ago, the higher pressure of the occidentals, as opposed to that of the orientals, is due to the fact that the former get more meat, fish, eggs and cheese than the latter. Protein in the diet increases the blood pressure which, because short in the Far East, compels its people to drink tea, coffee, and cacao (the methyl purines of which are identical with those furnished in the digestion of protein). Since we get all the meat and fish we want, we get along on fewer cups of coffee a day. The consumption of tea and coffee goes up as the meat ration drops. It is the drug way of making us feel better. When there is added to the element of sodium chloride restriction, that of the rice (carbohydrate) diet, things go down hill fastest of all. Of course, the blood pressure of the victim sinks. But nothing in the pathology of the patient is altered except for the worse. Put him back on sodium chloride and a square meal and in three days his blood pressure is back where it was before this therapy was started.

CHOICE OF THERAPEUTIC AGENTS  
FOR ANEMIA

W. R. ARROWSMITH, M. D.\*

NEW ORLEANS

Management of the patient with anemia is a very common problem for every practicing physician, whether in general practice or one of the specialties. This problem is complicated rather than simplified by the continuous bombardment of advertisements for antianemic preparations, letters which are confusing because in general they are filled with half-truths and incomplete summaries of reliable medical articles, cleverly interwoven to seem to support completely unjustified conclusions. In the face of this it is difficult for us to retain proper perspective of the problem of the anemic patient and realize that his management should be quite easy. For if any one can answer a few simple questions about the anemia, the proper treatment is usually obvious. The basis for the decision is not complicated; it consists of a history and physical examination, a complete blood count, a hematocrit, and occasionally a serum bilirubin, reticulocyte count, gastric analysis, or other laboratory study. With this information one can usually answer the key questions: "Is this patient anemic?", "Is this an acute or chronic anemia?", "What is the average cell size (or volume index)?", and "Are the cells deficient in hemoglobin (i.e., is the hemoglobin concentration or saturation index low)?"

Once these questions have been answered, one is well on the way to deciding first, the probable cause of the anemia, and second, what type of treatment is likely to be effective.

The first question, "Is the patient really anemic?", may seem out of place, yet the failure to answer that correctly is perhaps the greatest single pitfall in the treatment of anemia. Certainly the existence of an

anemia is such an important point to establish in diagnosis that anyone suspected of this should be entitled to a hemoglobin determination, red cell count, and hematocrit determination. And in the interpretation of these results, one must realize that these values are normally lower in children than in adults, lower in women than in men, lower in pregnant than in nonpregnant women, and that even within these groups there is a wide variation from average which may still be perfectly normal for that patient. Time does not permit further discussion of this point, except to emphasize that anyone treating anemias should have ready access to a chart of the range of these normal values, such as can be found in any good hematology textbook.

The next question, "Is this anemia acute or chronic?", must be answered chiefly from the history and physical examination. The conclusion can often be confirmed by the laboratory determinations, for it takes several weeks or months for a true macrocytic anemia or hypochromic anemia to develop. Normocytic normochromic anemias may be either acute or chronic. If the anemia is acute, it is almost certainly due to either blood loss or excessive blood destruction. If due to acute hemorrhage, the only important therapy for the anemia is the judicious use of transfusions while the cause of bleeding is being found and corrected; later, iron should be given to replace that lost in the hemorrhage. If the anemia is hemolytic, the problem is also one of supportive transfusions, if necessary, while the cause of the hemolysis is being identified and corrected. Even so, unless the patient is critically ill, transfusion usually is not necessary and should be deferred if possible so that the anemia may be studied more satisfactorily.

The next two questions may be considered together, for both are based on laboratory determinations. From the hematocrit value and red cell count one can calculate the mean corpuscular volume. From the hematocrit and hemoglobin values one derives the mean corpuscular hemoglobin concentration. Volume index and satura-

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tion index, respectively, may also be used to express these values. Those anemias which are macrocytic belong, with a very few exceptions, in one group; those that are definitely hypochromic, and usually also microcytic, in another; the rest, almost all of which are normocytic and normochromic, may be placed in a third group, although this latter is indeed a heterogeneous assortment. Let us now consider these groups individually.

In the early days of liver therapy, Castle showed that a substance in the diet, extrinsic factor, and a substance in normal gastric juice, intrinsic factor, were acted upon by the liver to form a third substance, erythrocyte maturation factor, which was essential to red cell maturation in the marrow. When this EMF was deficient for any reason, the red cells failed to mature, and instead of normal marrow, one saw many very immature nucleated erythrocytes. Further, those that escaped into the circulation were abnormal in size and shape, with the average size much larger than in normal blood. These changes occur regardless of the cause of the deficiency of EMF. Supplying the erythrocyte maturation factor, EMF brings about a dramatic improvement in the clinical picture within a few days, and a prompt maturation of the nucleated red cells of the marrow with a marked rise of reticulocytes in the blood stream in five to ten days after therapy is started. If the deficiency is the result of inadequate extrinsic factor in the diet, the only satisfactory treatment is a balanced diet; this may have to be supplemented at first. In the others, supplying the missing EMF is the treatment of choice, and the best source of this is liver extract. The dosage recommended is at least one antipernicious anemia unit per day, which can be administered as crude liver extract, purified liver extract, or as oral liver concentrate, provided one gives adequate amounts of a preparation assayed for antipernicious anemia principle. The agent of choice is purified liver extract, for it requires a smaller volume per injection, is less painful, produces fewer reactions, is

the least expensive per unit, and is fully as effective as crude liver. Most patients find oral liver more disagreeable than parenteral extracts.

Two other therapeutic agents have recently been tried in macrocytic anemias. The first of these, pteroyl glutamic acid, or folic acid, produces very satisfactory hematologic response but, in patients with pernicious anemia, frequently allows severe neurological lesions to develop and progress. Except for the unusual megaloblastic anemia of infancy it probably has no advantage over liver extract. In a practice limited to hematologic problems I have found no need for this preparation since it became available commercially, or any patient in whom its use improved the results obtained from purified liver extract. Its mode of action remains a mystery; it is neither intrinsic factor, extrinsic factor, nor erythrocyte maturation factor.

The second newcomer, vitamin B<sub>12</sub>, is too new to be completely evaluated. It is a compound containing cobalt, effective in doses of about one millionth of a gram per day, and very comparable to EMF in many ways. Castle has recently amended his original conclusions to postulate that vitamin B<sub>12</sub> is probably both extrinsic factor and EMF, and that intrinsic factor is probably an enzyme which promotes absorption of vitamin B<sub>12</sub> from the gastrointestinal tract. If this is correct, vitamin B<sub>12</sub> may eventually replace liver extract entirely in the treatment of macrocytic anemias. It does not seem to lead to increased neurologic damage, as folic acid does. Allergic reaction to vitamin B<sub>12</sub> does not seem to develop, as it occasionally does to the impurities of liver extract. However, experience with this substance is still quite limited, and until it has had much wider and longer use, I believe the agent of choice in the treatment of macrocytic anemias should be purified liver extract. The comparative daily cost of treatment of a patient with pernicious anemia with these various preparations, as taken from representative retail price lists, shows that at present purified liver extract is still the least expensive.

The second group, the hypochromic anemias, have as a common denominator a defect in iron metabolism. Iron is absorbed from the intestinal tract as a ferrous salt, forms a loose combination with protein, and is carried in the plasma to the reticulo-endothelial system where it is stored, chiefly in the liver, spleen, and marrow, or promptly synthesized into hemoglobin by the marrow. An important but small and apparently rather stable fraction is incorporated into tissue enzymes. When red blood cells break down the iron from the hemoglobin is removed and either reutilized or stored; contrary to older ideas there is no mechanism for the excretion of significant amounts of iron, and once in the body, iron remains there until lost by hemorrhage or pregnancy. Therefore, the only need for iron is for additional hemoglobin during periods of growth, for replacing the iron transferred from the mother to the fetus, and for replacing iron in hemoglobin lost through hemorrhage. The importance of this concept cannot be overemphasized, for in the absence of rapid growth, pregnancy or hemorrhage, the need for iron in the diet is nil, and iron deficiency occurs only as a result of one of them. In addition to actual iron deficiency, there are only two other significant causes of hypochromic anemia, namely, chronic infection or heredity. In the presence of infection there is interference with the ability of the body to utilize iron, and in chronic infections this may eventually result in hypochromic anemia. However, there is no lack of iron in the body, the iron stores are still available, and so long as the infection continues no amount of iron therapy will improve the anemia, so that there is no justification for attempts to treat this anemia with iron. The familial type of hypochromic microcytic anemia has been recognized for over two decades as Cooley's anemia, but, only in the last decade has it been commonly realized that a milder form of this disorder, usually known as thalassemia minor or Mediterranean disease, exists in adults, ordinarily without symptoms. The nature of the hereditary defect is not understood, and no

treatment is of value. The importance of establishing the diagnosis is to explain the nature of the disorder and its hereditary character to the patient, and avoid the common error of attributing his symptoms to his anemia and focusing his attention on it by months or, more often, years of ineffective, unnecessary and expensive treatment.

If a patient really needs iron, how much and what compound is best? The best preparation is a simple, readily soluble ferrous salt, and the two most commonly used are probably ferrous sulfate and ferrous gluconate. Ferrous sulfate is less expensive, and in proper dosage is usually well tolerated; however, those patients in whom gastrointestinal disturbances develop from ferrous sulfate usually are able to tolerate the gluconate satisfactorily. The usual maximum daily increase in hemoglobin is less than 2 per cent, which requires less than 100 mg. of new iron. Three 0.32 gm. (5 gr.) tablets of either the sulfate or gluconate contain well above this amount, so that one such tablet after each meal is ordinarily an optimum amount. Larger doses may be tried if the response is unsatisfactory, but too often the larger doses produce constipation, anorexia, nausea, and occasionally vomiting, and the patient discontinues treatment entirely. The immediate clinical response to iron therapy in patients who actually need it is a little less impressive than liver therapy in macrocytic anemias; however, the reticulocytosis and the rise in hemoglobin is comparable, and one may anticipate a completely normal blood count within four to six weeks. Failure to achieve and maintain this should be cause for careful search for the complicating factors. Parenteral iron therapy is seldom necessary; when it is, transfusion is probably the best form. A British preparation, saccharated oxide of iron, is very effective, well tolerated, but not yet available here.

The market is flooded with iron preparations combined with liver, folic acid, vitamins, bile salts, thyroid, and copper. What advantages do these have? None. If the patient actually needs iron, then iron alone is adequate. If there is a complicating dis-



order, it should receive treatment on its own merits. In therapeutic doses iron is absorbed satisfactorily even in the complete absence of hydrochloric acid, and clinical experience as well as experimental evidence amply confirms the fact that none of these so-called adjuvants need be given for completely satisfactory treatment of the iron deficiency. Furthermore the use of such "shotgun" preparations too often ruins the opportunity to confirm the diagnosis by observing the response to the one factor which is needed. Finally, the cost is often multiplied manifold.

The two most common anemias have been saved till last. The first of these, and the most common true anemia, is the simple normocytic normochromic anemia seen in patients with systemic disorders ranging from mild endocrine dysfunction to severe infections and malignancies. This anemia is not understood but appears to be the result of deranged metabolic processes in the patient. There is no effective treatment at present for this type of anemia, save correction of the primary disorder; if this can be done, the anemia disappears spontaneously and often surprisingly rapidly. Transfusions are of temporary value as a preoperative measure, but otherwise their benefit is fleeting and their expense and inconvenience seldom justifiable. The second and even more common is the patient, usually a woman, with neurasthenic symptoms whose hemoglobin is so often in the normal range but slightly below average, and who therefore has a diagnosis of anemia made and intensive therapy, usually parenteral liver or a "shotgun" preparation, started. The original diagnosis of anemia is usually based on either laboratory error in single blood count or failure of the physician to recognize that hemoglobin values of 11 gm. (or 70 per cent) or even less may be, and often are, normal values for that patient. The increasing cognizance on the part of the public of functional disturbances makes it even more important to explain the problem to the patient rather than focus her attention on one facet of it, thereby strengthening her

suspicion of organic disease and making the eventual proper management of her problem more difficult. Suffice it to say that no antianemic preparation has any effect on the hemoglobin level of this group of patients, beyond the normal variation from one blood count to the next.

In summary, the choice of a therapeutic agent in anemias depends upon establishing the presence of the anemia, its type, and its etiology. Judicious transfusion of whole blood may be a necessary supportive measure in a very ill patient while studies are made pending definite therapy. If the anemia is a true macrocytic anemia, the choice of therapeutic agents is still concentrated liver extract, with a few exceptions, although vitamin B<sub>12</sub> may eventually prove a satisfactory substitute. If the anemia is due to iron deficiency, the only agent necessary is a simple ferrous salt. The use of complex hematopoietic agents is unnecessary and merely increases the expense and confusion.

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## PSYCHOBIOLOGIC PSYCHIATRY\*

HERBERT E. HARMS, M. D.\*\*

NEW ORLEANS

It is indeed gratifying to me that our Society requested a discussion tonight within the realm of psychiatry. If you believe there will be great differences of opinion between the schools of medical psychology to be discussed, then you probably will be disappointed. There is little question that there have been divergent theories in the past, and undoubtedly new ones will appear, but clinically we are all interested in attempting to make the individual a more comfortable person within himself for psychiatry is still largely a clinical subject. It is true that there is a difference of emphasis in the various systems of medical psychology. Psychiatry is still in the

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stage in which far greater demands are being placed upon it than trained personnel can meet. The recent developments in psychiatry have been rapid. Its rise to prominence has a kind of Cinderella motif. It has been, until recently, the stepchild of medicine, especially so when it was isolated in the far away state hospitals. Under the stimulation of two world wars, especially the latter one, when crushing demands were made for help, it assumed a new status, and I might add, something of a new name, "psychosomatic medicine," which has suddenly seemed quite acceptable to even the most presuming organicist, who now finds himself fired with enthusiasm to know more about this stepchild suddenly grown big. He has a great desire to gain information regarding the essence of psychiatry which will be useful in his daily practice.

It has been realized by many new enthusiasts in the medical field that application of a certain theory, hurriedly read and poorly digested, cannot be the common denominator for all their office consultation problems. Research in psychiatry has been great, but it has not as yet discovered a one way out for mankind's emotional dilemmas. For any school of thought to set itself up as a panacea, or purport to have the one finite answer is, in our present state of knowledge, wishful thinking. Those who have attempted to apply a hastily learned psychiatric principle have been quickly disillusioned by its inefficacy when applied to a variety of cases.

It has always been the desire of psychobiologic thinking not to be guilty of isolationism in dealing with the dynamics of behavior, but rather to be interested broadly in multiple causation which can be handled therapeutically on an individualized basis. Thus, the principles of all disciplines within the field are utilized whenever possible in any given case.

I would suppose that the request made to contrast the formal analytic approach in treatment to the psychobiologic one indicates that these two approaches have been considered different by those educated in

the New Orleans centers of medicine. Actually, of course, there have been a whole series of schools, each of which has contributed something to the understanding of personality. Behavioristic experiments with infants in this country were based largely upon Pavlov's work and preceded the establishment of the Pavlovian laboratory of Horsely Gantt; Alfred Adler's teaching that personality difficulties have their roots in feelings of inferiority and insecurity, is still a concept used by many. Certainly, it has had a great influence in the field of education, as for example, the stressing of sports in the American educational system. You are all acquainted with the extroversion-introversion hypothesis of Carl G. Jung, which was so popularly discussed some years ago. There are the attitudinal theories of Allport and Vernon, who point out that by the time a child is old enough to wield a pencil or perhaps even walk he has built up a group of attitudes toward other persons, objects, space, and himself, all of which demonstrably influence his personality. There are other contributions including the widely used psychologic tests, which too have aided in understanding the behavior of people more thoroughly.

It is most important that Freud's recognition of dynamic principles in the field of hysteria was a brave and fruitful departure from all previous tradition at a time when stagnation was threatening psychiatry. At the same time his frank approach to the problems of sex, shunned with the most unreasonable prudishness, undoubtedly paved the way to such publications as the Kinsey Report, which would have been locked away from the reading public twenty years ago. The concept of conscious versus unconscious has proved practical even though there continues to be didactic debate as to what we understand by conscious activity. It was Adolf Meyer who said, "Man has his consciousness for his own convenience rather than for mere communication," and it was Nietzsche who remarked, "My memory says that I did it, my pride says that I could not have done it



and in the end, my memory yields." These simple statements seem to me to render the awesome concept of consciousness rather easy to understand. Adolf Meyer<sup>1</sup>, coiner of the term psychobiology, succinctly expressed his views on the subject when he wrote, "In the simple and direct words of the man in the street, objective psychobiology occupies itself with performances, actions, reactions, and attitudes, thoughts and expressions of a person or group, of sufficient importance to call for attention for the role it plays in the person's life, and to deserve being scrutinized for the conditions of its occurrence, the factors that enter, their working and their effects and results, and the range of their modifiability. And within this setting it is the task of the observer to know how far he has to go into the distributive analysis to be in command of the facts for the understanding and management of the person."

Psychobiology has always striven to be both eclectic and pragmatic. I recall that in 1936, when prefrontal lobotomies were first done in this country, Meyer assisted those with the courage to begin this work. He was not averse, finally and after considerable deliberation, to use the various shock therapies and to aid their development directly. He was interested in what the orthodox analyst would contribute to the knowledge of personality development. He has often said, "Let us use that which works."

What one considers psychoanalysis, is today, changing. There is that concept which is based on conformity to the requirements of daily interviews, uninterrupted free association, and the use of a couch, and which expects the inevitability of the transference neurosis. All modern psychiatric practice is in a broad sense analytic, for it is the aim of all of us to use available psychodynamic principles. It is further, it seems to me, important to shorten, so far as is possible for purposes of economy, the duration of treatment. To this end we are indebted to the investigations of the painstaking analyses carried out in the past, and in the words of Gregg, we should capitalize

on these research gains by applying again those "things which work." This has always been a psychobiologic aim; it has also been its purpose to carry to the profession at large the lesson that all are potential psychotherapists if they will but listen and have interest in learning. Further, it has been its principle to give direction to a patient rather than to allow him to go on in his process of viewing himself with such autistic scrutiny as to lose perspective of his responsibility.

We are all indebted to Freud and his co-workers for the concept of time in treatment. A few years ago, emphasis was laid upon some special event which, if ferreted out, would relieve the problem through intellectualization. In this direction, I am constantly reminded of the impatience of referring physicians when a specific dynamic formulation has not been attained soon enough; they erroneously believe that such intellectualization would put an end to the problem at hand.

Patients are today prepared to expend time and effort toward a better understanding of themselves through a series of interviews rather than from one consultation in which the physician is expected to supply a simple formula for good mental health.

The goal of the patient and physician in a joint therapeutic venture is directed toward synthesis of the various factors which will offer security. Treatment is guided by the need of achieving a more wholesome integration of the personality. I have often said that if physicians recorded their advice to patients, they would have many embarrassing surprises if they later listened to these recordings. All statements to patients should be brief and easy to comprehend. Evaluation of a patient's problems should not be carried out along lines of rigid situations and reactions thereto, but rather the finely shaded as well as the intense emotions should be weighed for their influence upon the person.

Every interview must be ultimately constructive and must support the self. Patients, in scrutinizing themselves, often become aware of their shortcomings and fail-

ures. Care must be taken not to allow them to dwell on their sense of failure in order to avoid a complete breakdown of an already sagging personality. One should expect the patient to retrace his steps in therapy to know what he has said, why he said it, and what significance it has been to him. All too often patients leave with only poor comprehension of the psychotherapeutic efforts of their psychiatrist.

We speak in psychobiology of distributive analysis and synthesis, and this is adjusted to the patient's needs and type of illness. Psychobiology does not exclude other therapies, whether they be physiologic or otherwise, but believes they should go hand in hand if need be. In this sense it strives for a more total approach. It can, on the other hand, confine itself to the psychologic illness itself, making free use of free association, dreams, symptomatic acting out of emotions, reactions of hostility, and the many other meaningful inner psychologic processes.

We have made free use of those wartime developments of narcosynthesis to shorten the duration of treatment, and of insulin as a physiologic means of reducing tension. It is the purpose of medicine to seek out the shortest route to health. It is my belief that a pluralistic approach is frequently sufficient to achieve good personality function on a plane commensurate with the natural assets the person possesses.

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### TREATMENT OF PSYCHOSOMATIC DISORDERS IN THE MALE PATIENT\*

JOHN W. BICK, JR., M. D.

NEW ORLEANS

Uncertainty and anxiety plague many patients who consult us today. Although less demonstrative than his mate, the male of our species is by no means immune from

psychological problems. A rapidly growing, complex social structure deprives him of the important place he once occupied in his home. Occupational pressures make the development of avocational pursuits all but impossible. Neurotic shackles often so bind his wife that lack of sex expression becomes another difficulty which besets him.

Not only is his present situation difficult but insecurity both emotional and environmental characterized his early years. A considerable proportion of his adult life was spent in a war torn world. He saw his life regimented during several years of military service and observed emotional problems develop all around him. Economic and political insecurity confront his future years. For the first time in his earthly history man is preoccupied with the possibility of complete atomic destruction in the not too distant future. Truly a remarkable and tragic picture confronts us when we consider what man has made of man and what he has brought upon himself.

As physicians, we are interested in man's frustrations and in his attempts at solution. He may show aggressive outbursts and become an antisocial creature in constant difficulty with his environment or he may find life's entire process too confusing and withdraw into the unreality of a psychosis. Most frequently, however, he compromises; he sickens and resumes a dependent infantile status wherein illness offers an escape from a dilemma which seems impossible. The study of man, his sickness, his escapes, his environment, and his background constitutes another approach to his problems which we have come to call psychosomatic medicine.

Psychosomatic medicine is neither a new discipline nor a new specialty. For generations it was understood that emotional processes played a role in the genesis and course of certain disease processes. Many of us have heard our colleagues remark that Mr. Smith's blood pressure was rising and that he had better be given some sedation until the impending business deal was past. Or perhaps the physician expressed concern over Mrs. Smith's recent migraine attack

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and decided that Smith needed a hint that too much attention to the office routine and not enough to Mrs. Smith is a fault that needs correction. While it is true that often such an approach was practiced by the physician not at all acquainted with the discipline we are here discussing, nonetheless, he was practicing a form of psychosomatic therapy, a new term perhaps, but an art as old as medicine itself. We shall simply attempt now to briefly organize some of the concepts and ideas which explain the efficacy of an approach which considers the individual and not solely his disease.

It is unfortunate but true that dealing with the patient instead of with his disease is for many physicians a lost art. During the twentieth century medical science along with other trends in our daily lives has become more and more mechanistic. Increasing concern with blood chemistries, electrocardiograms, x-ray films, to say nothing of exploratory laparatomies, allows little time for us to consider the patient with his ancestors, his early life, his sexual adjustment, his vocational status, his drives, anxieties, fears, fantasies, hobbies, or bank account. Until we have some awareness of the patient's content of thought, until we know the patient as a personality instead of just another stomach or heart, our therapeutic abilities will be extremely handicapped.

An important concept in psychosomatic processes lies in the belief that emotional processes influence and at times precede tissue change. For example, most of us will accept the idea that in persons with a labile blood pressure, chronic anxiety and apprehension may influence blood pressure elevation and thus be an important factor in the chain of events which finally produces the terminal picture of hypertensive heart disease. A similar case can be made out for the patient with migraine, peptic ulcer, ulcerative colitis, and certain skin disorders, chiefly the atopic dermatoses. Let us briefly consider some of the thinking and behavior habits of modern man that we feel play an important part in leading him to his own destruction.

One feature that makes life unpleasant and at times intolerable is anxiety. Difficult to define but because it is so universally present, a definition is not too essential. Various described as a feeling of impending disaster, a feeling of morbid apprehension, and the like, it is accompanied by a series of physiological occurrences with which all of us are familiar. Perhaps its origin lies in the individual's remote past; perhaps it lies in an early sex trauma, perhaps it was recently reactivated by a trying life situation. Regardless of its origin or severity, it must be understood by all of us that it is a common feature in practically every patient who consults his doctor. Our success or failure in large measure depends upon our ability as therapists to handle the patient's anxiety.

Modern man finds himself in a peculiar situation. Being primarily the more aggressive of the two sexes, he is surrounded by women who often are trying to outdo him in the expression of their aggression. During the past half century we have seen woman achieve her long sought emancipation. Far from being dependent upon her mate, she now finds herself competing with him at every turn. This brings us to a common emotion which is of considerable importance in the topic we are discussing, namely man's hostility. Those of us who spent anytime as doctors in the military service and inquired into the lives of the American soldiers obtained some idea of the origin of this feeling. Reared often by a mother who was unable to look to a husband for the satisfaction of her dependency feelings, she looked to her young son for the emotional satisfaction thus denied her. All too often she made every effort to keep the tie between her son and the umbilical apron strings a permanent one. This attempt often leads to the boy's first expression of hostility. Early he is hostile to the father in whom he sees a threat to his dependent status, later the hostility is directed toward his mother in whom he sees a threat to his independence and aggressive needs. Still later it is directed toward his wife, for all too often he finds himself bur-

dened with another "mom" whose habits and ideas cause a reiteration of anxieties long dormant but still exerting their dynamic pressures in countless ways.

Man needs to be dependent to a degree at least; but when his dependence becomes excessive, we have the picture of which so many of us are aware in our neurotic patients. Complaining bitterly, unable to accept their responsibility, this attitude at times leads to a reversal of the spouses' responsibilities which we occasionally see when a neurotic illness becomes so crippling that the husband remains at home and is a semi-invalid while the wife assumes the bread-winning duties.

Let us return now for a moment to the concept of hostility. There is little opportunity for the expression of our hates in today's world. Physical violence, feuds, duels, and opportunity for physical combat have all rightfully gone with previous cultures. Failing in an outlet for his hostility man often turns it upon himself. The expression of this hostility frequently is so thwarted that his bodily processes are called upon to express feelings so strong as to be otherwise unexpressed. While it is not permissible to speak one's mind freely regarding a hated social or business competitor, society allows such phrases as "I can't stomach him" to become commonplace. Unexpressed conflicts between hostile urges and a resented need for dependency are now known to exist in the majority of our peptic ulcer patients. When we remember how frequently the functions of the lower digestive tract are called upon conversationally to express our dislike for a situation or for an event I feel that it is not asking for too much when I suggest that you consider some of the foregoing as possible clues in the etiology of functional diarrheas.

Because of the great variation seen in the cases which confront us because of psychosomatic problems no single procedure can be outlined which will apply to all. A few principles when borne in mind can be of some assistance. Since every psychosomatic illness may be looked upon as a

faulty adjustment technic, and since the error must be in the individual, the environment, or both, we must be fully acquainted with the individual and the sphere in which he operates before we can plan a therapeutic approach.

One difficulty which confronts many of our male patients is an excessive degree of conscientiousness and attention to duty. Such men are quite prone to feelings of anxiety and guilt. Patients will often attribute to some superficial environmental feature, their outstanding psychologic symptom. It becomes the duty of the therapist to listen tolerantly but ever watchfully for some unsuspected conflict to arise which will more fully explain the set of symptoms. Often such explorations will take us back to the patient's remote past.

It should be mentioned in passing that anxiety is usually produced by feelings of hostility and guilt. It frequently happens that the hostility was set into motion by the patient's attitude toward a firm unyielding father in whom the patient early saw a threat to his own security and supremacy. It frequently happens that such feelings of hostility persist into adult life. Often they express themselves in other forms. A driving ambition, a relentless urge to success, a never relaxing work program are manifestations of disguised hostility which often occur in the patient with a psychosomatic disorder.

When we acquaint ourselves with the threats, misinformation, and punishment which are administered children in their formative years, it is easy to see why so much guilt and anxiety is associated with sexual trauma. Often an act which was associated with considerable infantile anxiety is forgotten but the anxiety persists, to be reactivated in later life when confronted with another stress producing situation. I believe it is safe to say that anxiety and guilt cause more unhappiness, prevent more freedom, and are responsible for more disagreeable symptoms than any other feature which confronts the physician. Unfortunately, man and physicians have been slow to recognize this. In lay prose and poetry



the concept of psychosomatic etiology has been mentioned before we gave it even a passing thought. A recent British poet, A. E. Housman expresses such an idea succinctly:

"Could man be drunk forever  
With liquor love or fights,  
Lief should I rouse at morning  
And lief lie down at night."

"But men at whiles are sober  
And think by fits and starts,  
And if they think, they fasten  
Their hands upon their hearts."

In general, the therapeutic approach always consists in giving the patient insight. His hostility, his anxiety, his guilt must be brought to the surface. There objectively examined by patient and physician in their true perspective, the relationship between the present symptoms and early emotional experiences are brought into clear focus. Under the guidance of a wise, mature physician, the more painful aspects of probing into the unpleasant past are always tempered by reassurance, helpful planning of a daily routine, and other helpful therapeutic approaches. But such steps should not obscure the principal goal, namely the giving of insight, so that the patient can see himself and understand his anxiety and mode of life.

At this point I should like to depart for a moment and criticize one approach which physicians make in dealing with their patients. Next to the clergy, physicians are the group most often clothed with the mantle of infallibility by their patients. It is not surprising then that the physician who is lauded by his patients, praised by the press, emulated by students and junior staff members, finds it difficult to avoid a demeanor which on occasions is equalled only by the operatic prima donna. Probably one characteristic of certain physicians does more than all others to minimize his capability as a psychotherapist. I refer to the often assumed role of infallible authority. Consider for a moment a hypothetical hypertensive patient. Suffering from headaches, just rejected as noninsurable by an insurance examiner, he enters

his doctor's office with anxieties, fears, and phobias of impending death or of a momentary stroke. By his first few words the physician is often able to influence the entire course of the patient's remaining years of life. He may adopt a friendly yet firm approach, letting the patient see in him a physician and friend in whom he can confide and in whom he can find a source of guidance or assistance. On the other hand, the physician may glumly adjust the blood pressure cuff, looking the patient squarely in the eye, he may remark, "Mr. Doe, are your affairs in order? From the looks of things you won't have much longer with us, you know. Of course, I might be able to help you if you do exactly as I say." The physician's orders are likely to be more crippling than the affliction itself, no cigarettes, despite the fact that the patient is a chain smoker, no alcohol despite twenty years of social drinking, no work despite a lifelong drive which was the only outlet for a vast series of hostilities and anxieties. The only prescription is complete bed rest or retirement to a country cabin. A hostile aggressive male suddenly reduced to the status of complete bed rest has naught to occupy his thoughts but ever increasing resentment. It is not surprising then that the therapy by reducing all possible outlets may be an important factor in precipitating the untimely end.

Most patients resent authority. A patient with a functional gastrointestinal complaint recently told me that he would never return to his physician for further treatment; "When he fusses at me about an occasional cigarette he sounds just like my old man getting ready to beat me." Absolute prohibitions accomplish little more than the production of an attitude like the above.

The physician needs to know himself too. Our object is to help our patient, not to control his thinking. Our aim is to relieve his symptoms, his anxieties, and not to burden him with our own prejudices, aversions, and a way of life which he cannot tolerate and does not want. Always must he guard against the expression of

his own hostilities in dealing with those seeking his help.

Impatience has no place in the physician's therapeutic efforts. Our patients will continue to manifest foibles. Advice to avoid sexual relationships to a cardiac patient will not always be followed. Tobacco and alcohol need still be utilized in helping us tolerate the problems and frustrations and anxieties of everyday life. Let us then be content in the knowledge that the vast majority of our patients will continue as always to be moderately good, moderately bad, occasionally given to excessiveness and indiscretions but we need not allow their lapses to cause feelings of rejection to arise in our hearts. Let us be ever willing to help, ever anxious to be a patient listener sufficiently detached from the patient and aware of our own emotional problems to assist the patient to maintain the Good Life.

I hope I have stimulated some interest in the patient, in his hostilities, his anxieties, his dependencies. The patient is always more important than any single organ or structure. Realizing this, it becomes apparent that the physician has a more important function than simply writing prescriptions and giving advice. He will utilize constructive reassurance, a healthy relationship that will allow the solution of anxieties as they arise, and constructive outlets for hostilities as they appear. Helping the patient achieve emotional maturity will always be the prime function of the good physician regardless of the patient's presenting symptoms. And finally let us remember that chronic, anxious thinking can at times be just as destructive as virulent organisms or malignancies. With this in mind the physician can assist the patient in plans for his daily routine, realizing that relaxation is perhaps more essential than anxiety. Our poet saw this years ago when he said:

"Oh, tis jesting, dancing, drinking  
Spins the heavy world around  
If young hearts were not so clever,  
Oh, they would be young forever  
Think no more; 'tis only thinking  
Lays lads underground."

## OBSTETRICAL REPORT OF THE SOUTHERN BAPTIST HOSPITAL FOR 1948

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DANIEL R. THORNTON, JR., M. D.

NEW ORLEANS

In order to evaluate the obstetrical results in the Southern Baptist Hospital, and to obtain, by comparison with others, a true picture of the type of work being done, this analysis is presented. We hope that by presenting the overall picture of a year's work, we can get far enough away from a single case to see the results we are actually obtaining and the methods we are using. The aim of our study is that this report will stimulate us to improve our end results and to better our records. We also hope that such a report will motivate similar reports from other hospitals in New Orleans and throughout Louisiana.

The question has frequently been asked at the Southern Baptist Hospital as to whether the obstetrical service was increasing or decreasing in deliveries per year. Table 1 shows a drop of 415 patients in 1948 as compared with 1947—the first significant decrease in the past decade. This possibly reflects the long-expected decline in the general birth rate.

TABLE 1  
SOUTHERN BAPTIST HOSPITAL,  
TOTAL DELIVERIES

1939 .....	734
1940 .....	971
1941 .....	1296
1942 .....	1624
1943 .....	2357
1944 .....	2748
1945 .....	2695
1946 .....	2870
1947 .....	2968
1948 .....	2553

A comparison of the number of deliveries in the five largest hospitals in New Orleans is shown in Table 2.



TABLE 2  
TOTAL DELIVERIES OF FIVE NEW ORLEANS  
HOSPITALS, 1948

Southern Baptist Hospital .....	2553
Charity Hospital .....	8113
Touro Infirmary .....	2168
Hotel Dieu .....	2217
Mercy Hospital .....	1160

To clarify our definition of a birth, we have used the standard of any delivery of an infant or infants, dead or alive, weighing 1000 gm. (2 pounds, 3 ounces) or more, taking place within the confines of the hospital building. Cases of twenty weeks' pregnancy or more are handled on the obstetrical service, but those infants weighing less than the above mentioned standard are not included in this report.

Comparison of private cases to service cases is as follows:

Private cases.....	2494	(97.7 per cent)
Service cases.....	59	( 2.3 per cent)

The service cases (2.3 per cent) are admitted in the name of various department members and are handled under their direction by the residents. Seventy per cent of the private cases were handled by the twenty-seven members of the Department of Obstetrics and Gynecology, and the remaining 27.7 per cent were admitted to the services of 31 other physicians.

The total number of cases consisted of 1097 primiparae (43 per cent) and 1456 multiparae (57 per cent).

CESAREAN SECTION

Of the total deliveries in 1948, 188 (7.4 per cent) were cesarean sections. Table 3 shows comparative percentages with other institutions.

TABLE 3  
CESAREAN SECTION RATE COMPARED WITH  
OTHER INSTITUTIONS

Total deliveries, Southern Baptist Hospital.....	2553
Vaginal deliveries .....	2365
Cesarean sections .....	188 (7.4%)
Charity Hospital .....	3.4%
Tulane .....	4.3%
L. S. U. ....	3.4%
Independent .....	2.9%
Touro Infirmary .....	10.7%
Hotel Dieu .....	4.9%
Mercy Hospital .....	8.3%
Margaret Hague .....	3.8%

Frequently the question has arisen as to the changing status of our rate of cesarean sections. Table 4 shows the percentage of sections at the Southern Baptist Hospital for the past decade.

TABLE 4  
SOUTHERN BAPTIST HOSPITAL  
SECTION RATE

1939 .....	6.8%
1940 .....	7.6%
1941 .....	6.2%
1942 .....	5.0%
1943 .....	4.5%
1944 .....	5.9%
1945 .....	5.0%
1946 .....	4.7%
1947 .....	7.7%
1948 .....	7.4%

It will be noted that there was a decrease during the war years, possibly related to the large number of cases handled in the hospital by the Navy. However, the pre-war and postwar years are closely comparable, and 1947 and 1948 show virtually no change.

The types of cesarean sections are shown in Table 5.

TABLE 5  
TYPES OF CESAREAN SECTION

Total Cesarean sections.....	188
Classical .....	20
Low .....	152
Intra-extraperitoneal .....	11
Extraperitoneal .....	2
Porro .....	3

The low section represents 88.1 per cent of the total; the intra-extraperitoneal section is according to the technic of Cacciarelli.

The type of anesthesia used is indicated in Table 6.

TABLE 6  
CESAREAN SECTION ANESTHESIA

Spinal .....	172
General .....	15
Local .....	1

Practically the only disadvantage of spinal anesthesia, as expressed by the anesthesia staff, is the fall in blood pressure which occurs in almost every case. Methods to prevent this include the beginning of a transfusion or infusion immediately after

the spinal is given. Vasopressor drugs are given either in the spinal injection just before the spinal is administered, or as soon as the blood pressure fall is noted.

Seventy per cent (131) of the sections were primary. Indications for these are shown in Table 7.

TABLE 7

## INDICATIONS FOR PRIMARY CESAREAN SECTIONS

Caphalo-pelvic disproportion .....	70
Placenta praevia .....	12
Elderly primiparae (2 breech) .....	11
Cervical dystocia .....	9
Abruptio .....	6
Toxemia .....	6
Breech with disproportion .....	3
Cardiac .....	2
Face .....	2
Fibroids .....	2
Diabetes .....	1
Hip ankylosis .....	1
Hemorrhage into bladder .....	1
Psychosis (for sterilization) .....	1
Previous repair .....	1
Twins with compound presentation .....	1
Uterine inertia .....	1
Not specified .....	1

The remaining 57 (30 per cent) were done because of previous sections—the indications for the previous section still existing in some instances and not in others. Only a relatively few patients who had undergone previous abdominal delivery were allowed to deliver from below. We detect an increase in these cases, however.

## VAGINAL DELIVERIES

The remaining cases were handled vaginally. There were 80 breech presentations (3.5 per cent), 2 transverse presentations, and 1 face. Note that there were 2 other face presentations among the sections, making the incidence of face presentations less than Reddoch's report.

TABLE 8  
PRESENTATION IN VAGINAL DELIVERIES

Total vaginal deliveries .....	2365
Vertex .....	2282
Breech .....	80
Transverse .....	2
Face .....	1

The 2282 vertex presentations may be further analyzed as follows:

TABLE 9  
MANNER OF DELIVERY IN VERTEX PRESENTATION

Spontaneous .....	1007
Low forceps .....	1105
Mid forceps .....	48
Manual rotation .....	26
Scanzoni's maneuver .....	67
Other forceps rotations .....	21
Version and extraction .....	8

The 80 breech deliveries were handled as follows:

TABLE 10  
TYPES OF BREECH DELIVERIES

Extraction with forceps .....	18
Extraction without forceps .....	17
Assisted, with forceps .....	13
Assisted, without forceps .....	24
Spontaneous .....	8

## PRENATAL COMPLICATIONS

Table 11 reveals the prenatal complications as they are described on the hospital records.

TABLE 11  
PRENATAL COMPLICATIONS

Secondary anemia .....	262
Pre-eclampsia .....	36
Lues .....	18
Hypertension toxemia .....	16
Pyelitis .....	6
Diabetes .....	3
Fibroids .....	2
Vaginal cyst .....	1
Mitral stenosis .....	1
Acute Bartholin cyst .....	1
Laparotomy for ovarian cyst .....	1
Pathological Braxton-Hicks contractions .....	1
Eclampsia .....	1
Psychosis .....	1
Tuberculosis of the hip .....	1
Amebiasis .....	1

Those patients having an erythrocyte count of less than 3,500,000 were included in the tabulation on secondary anemia.

The complications encountered at labor and delivery and the operative procedures employed are shown in Table 12.

It will be noted that saddle block was used in 217 cases, or 9.2 per cent of all vaginal deliveries. No caudals were given during the year.

## FETAL COMPLICATIONS

There were 16 twin births (a low incidence of 1 to 159 deliveries), making a total of 2569 babies born during 1948. Of these, 34 were stillborn, 1.3 per cent of live



births. This is a figure comparable with Touro Infirmary's 1948 incidence of 1.5 per cent and Margaret Hague's 1.7 per cent. The causes of stillbirths are shown in Table 14.

TABLE 12  
COMPLICATIONS AND OPERATIONS OF LABOR  
AND DELIVERY

Episiotomies .....	1651
1 <sup>o</sup> lacerations .....	153
2 <sup>o</sup> lacerations .....	73
3 <sup>o</sup> lacerations .....	9
Cervical lacerations .....	103
Medical induction .....	156
Surgical induction (including rupture of membranes).....	58
Manual removal of placenta.....	20
Sterilization at section.....	18
Intrapartal hemorrhage .....	17
Placenta praevia .....	14
Abruptio .....	13
Prolapsed cord .....	7
Contraction ring .....	3
Ruptured uterus with hysterectomy.....	2
Hysterectomy for fibroid .....	1
Circumvallate placenta .....	1
Craniotomy .....	1
Acute pulmonary edema .....	1
Massive bladder hemorrhage.....	1
Duhrssen's incision .....	1

ANESTHESIA

Anesthesia was as follows:

TABLE 13  
PRINCIPAL ANESTHESIA IN ALL DELIVERIES

Total cases .....	2553
Ethylene .....	1997
Saddle block.....	217
Spinal .....	172
Chloroform .....	109
Cyclopropane .....	19
Ether .....	14
Local and pudendal block....	13
None .....	12

TABLE 14  
ETIOLOGY OF STILLBORN DELIVERIES

Cause unknown .....	11
Abruptio .....	8
Rh sensitization .....	4
Pre-eclampsia and abruptio .....	3
Prolapsed cord .....	2
Hydrocephalic .....	2
Breech extraction .....	1
True knot in cord .....	1
Placenta praevia .....	1
Cord strangulation .....	1

When correction is made for congenital deformities incompatible with life and for cases in which no heart tones were audible after admission (mostly macerated), the corrected stillborn mortality is 25, or 1.1 per cent.

There were 25 neonatal deaths during the year, or an over-all incidence of 1.1 per cent. This is compared with Touro Infirmary's 2.4 per cent and Margaret Hague's 1.9 per cent. The causes of death are shown in Table 15.

TABLE 15  
ETIOLOGY OF NEONATAL DEATHS

Prematurity .....	10
Congenital anomalies .....	4
Erythroblastosis .....	2
Cerebral hemorrhage in premature.....	2
Prolapsed cord with cerebral damage.....	1
Atelectasis and suppurative pancreatitis.....	1
Cerebral hemorrhage from Scanzoni's maneu- ver, version and extraction, Bandl's contrac- tion ring .....	1
Cerebral hemorrhage from version and extrac- tion for transverse presentation.....	1
Placenta praevia .....	1
Atelectasis .....	1
Meconium obstruction .....	1

When prematures below 1500 gm. (3 pounds, 5 ounces) and congenital anomalies incompatible with life are discounted, the corrected infant mortality was 17, or 0.7 per cent.

The combined stillborn and neonatal deaths were 59—an incidence of 2.3 per cent—comparable with Long Island College Hospital's 2.2 per cent and Chicago Lying In's 2.5 per cent. The total corrected deaths were 42, or 1.7 per cent.

There were 137 premature live births, using, as the standard, weight of less than 2500 gm. (5 pounds, 8 ounces). This is a premature incidence of 5.8 per cent. Thirteen prematures failed to survive, a premature death rate of 9.4 per cent. When this figure is corrected for congenital anomalies and for weight of 1500 gm. or less (3 pounds, 8 ounces), a corrected premature mortality rate of 5.1 per cent is shown.

Injuries and abnormalities of surviving babies are shown in Table 16.

TABLE 16  
FETAL INJURIES AND ABNORMALITIES

Club foot .....	5
Facial paralysis .....	2
Lues .....	1
Absence of sternocleidomastoid muscle .....	1
Branchial cleft cyst .....	1
Mongolism with harelip .....	1
Umbilical hernia .....	1
Brachial palsy .....	1
Web foot .....	1
Hypospadias—severe .....	1
Fracture of left clavicle .....	1
Cephalhematoma .....	1

## PUERPERIUM

Complications of the puerperium are indicated in Table 17. The international morbidity standard is used for the determination of that factor. Where no extrapelvic cause of fever was noted on the hospital record, that case was considered a corrected morbidity.

TABLE 17  
COMPLICATIONS OF THE PUERPERIUM

Total morbidity .....	73 (2.8%)
Corrected morbidity .....	52 (2.0%)
Section morbidity .....	30 (16%)

## POSTPARTAL COMPLICATIONS AND OPERATIONS

Postpartal hemorrhage .....	16
Urinary tract infection.....	15
Postpartal eclampsia .....	2
Postpartal sterilization .....	2
Hematoma vulva .....	2
Upper respiratory infection .....	2
Jaundice (cause unknown) .....	2
Gastroenteritis .....	1
Breast abscess .....	1
Episiotomy breakdown .....	1
Streptococcus peritonitis .....	1
Pneumonia .....	1
Psychosis .....	1
Eczematoid dermatitis .....	1

## SUMMARY

In reviewing the records of 2553 deliveries at Southern Baptist Hospital for 1948, no maternal mortalities were noted. The fetal mortality rate compares favorably with other obstetrical centers. The cesarean section rate is moderately high, while the keynote of the vaginal deliveries is conservatism.

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## OBSTETRIC DEATHS RELATED TO ANESTHESIA

## REPORT OF FIFTEEN CASES\*

FRANK R. LOCK, M. D.

LOCKERT B. MASON, M. D.

Waters and Gillespie<sup>1</sup>, reporting on operating room deaths in the Wisconsin General Hospital, stressed the fact that the particular anesthetic agent employed is of less importance than the care with which it is administered. Adriani<sup>2,6</sup> called attention to failure of the anesthetist to observe and heed prodromal signs and symptoms of impending complications. This failure may be due to faulty understanding of the action of the anesthetic agent, or to lack of experience in its administration. Too frequently the potential hazard of anesthesia is not recognized, and anesthetization is relegated to the inexperienced.

Reports of 392 maternal deaths occurring between August 1, 1946, and May 1, 1948, are in the files of the Maternal Welfare Committee of the Medical Society of the State of North Carolina. Fifteen of these deaths are attributed to anesthetic complications. These 15 deaths form the basis of this communication.

Information regarding each patient was obtained from questionnaires completed by the responsible attendant. Although the reports did not include a complete anesthetic record or postmortem examination, the

\*From the Committee on Maternal Welfare of the Medical Society of the State of North Carolina and the Department of Obstetrics and Gynecology of the Bowman Gray School of Medicine of the Wake Forest College, Winston-Salem, North Carolina.



data were sufficient in most instances to establish the cause of death.

#### INHALATION ANESTHESIA

Five patients received the anesthetic agent by inhalation. In 4 cases ether was used. The fifth patient had nitrous oxide, ether and oxygen, supplemented by intravenous intocostrin.

Case No. 1. A 25 year old white primipara began labor spontaneously at term. Demerol was given three times during labor, scopolamine twice. During early labor fluids and small amounts of semisolid food were permitted; nothing was given by mouth after the fifteenth hour. After twenty-five hours the patient was prepared for delivery. Blood pressure, pulse, and respiration were normal. A nurse, who was accustomed to giving chloroform, administered ether by the open drop method. Induction was stormy. During the delivery the vaginal blood was quite dark, but no unusual bleeding occurred.

Very soon after delivery, atropine was given because the patient seemed "damp." While reacting from the anesthetic, she vomited large amounts of green fluid, and immediately afterward respirations became rapid and "choppy." Her face became cyanotic, and she began to cough as reflexes returned. The pulse rose to 120, although the blood pressure remained 120 systolic, 80 diastolic. Atelectasis of the right lung was noted, the foot of the bed was elevated, and oxygen was given by mask. No bronchoscopist was available. Dyspnea continued, and severe pulmonary edema developed. The patient died four and one-half hours after the delivery.

Case No. 2. A 24 year old white multipara received nembutal and scopolamine during a short, spontaneous labor at term. When the head appeared at the introitus, administration of ether by the open drop method was begun. During the second stage of anesthesia the patient vomited a large amount of liquid and solid material. Aspiration of vomitus occurred, and the patient became very cyanotic. The airway was cleared by suction, and the baby was quickly delivered in good condition. No unusual blood loss occurred. Cyanosis and tachycardia continued, in spite of oxygen, postural drainage, and digitalization. The temperature rapidly rose to 103° F. Pulmonary edema developed, and death occurred thirty-eight hours after delivery.

Case No. 3. An obese white primipara, 34 years of age, was first seen in early labor. She had been previously advised against pregnancy because of "heart trouble." On admission the patient was cyanotic and dyspneic. The cardiac rhythm was normal, the rate 80, and the blood pressure 110 systolic, 80 diastolic. Digifortis was given. The patient's condition remained unchanged through-

cut the long labor, during which she received 30 mg. of morphine, administered in two doses. After forty-eight hours, she was anesthetized with ether given by the open drop method. During a forceps delivery the blood became dark, and signs of shock appeared. Coramine and plasma were administered. She appeared to react favorably until an hour later, when profound shock developed and the patient expired.

Case No. 4. A 21 year old white primipara went into spontaneous labor at term. A soft systolic murmur had been present at the base of the heart for many years. At the fourth hour of labor 100 mg. of demerol, and 0.4 mg. of scopolamine were given. After six hours of labor, ether was administered by the open drop method for delivery. After 60 cc. had been given, the patient was still swallowing and moving on the table. Respiration suddenly ceased, and cyanosis appeared rapidly. The airway was open. Efforts at resuscitation failed, and the heart soon stopped. The child was not delivered.

Case No. 5. A colored woman, aged 20, had had slight vaginal bleeding for ten days during the third month of pregnancy. A diagnosis of ectopic pregnancy was made, and operation was advised. Prior to operation the blood pressure was 126 systolic, 84 diastolic, and the pulse 80. A blood count showed 11.5 gm. of hemoglobin per 100 cc. and 7,100 WBC.

Ten milligrams of morphine, and 0.4 mg. of atropine were given preoperatively. Anesthesia was induced with nitrous oxide, ether, and oxygen. Sixty units of intocostrin (curare) were given for additional relaxation. The patient's condition during anesthesia was described as poor, although the blood pressure and pulse stayed within normal limits. On opening the abdomen an amniotic sac containing a fetus 2 inches in length was found. The placenta was attached to the peritoneum of the cul-de-sac. The left tube and ovary and the products of conception were removed without difficulty and with only moderate blood loss.

The patient left the operating room in fair condition. Very soon after she returned to her room the nurses noted the presence of excess mucus in the respiratory tract. Efforts to clear the airway were unsuccessful, and the patient died.

#### COMMENT

Cases Nos. 1 and 2 illustrate the danger associated with vomiting during the second stage of anesthesia and during reaction from the anesthetic. Mendelson<sup>3</sup> has described two syndromes occurring after aspiration of stomach contents. The first is atelectasis resulting from the aspiration of solid material. The second is an asthma-like state which follows aspiration of acid

liquid vomitus. Cases Nos. 1 and 2 represent a combination of the syndromes.

The prolonged gastric emptying time of the patient in labor is too frequently overlooked. Mendelson<sup>3</sup> has suggested that the time of the most recent oral ingestion be recorded on the labor sheet. Gastric lavage should be done whenever it is suspected that the stomach is not empty. A transparent face mask to permit quicker observation of vomiting has been recommended.

Case No. 3 records the result of further anoxemia produced by ether anesthesia in a patient who already exhibited cyanosis, presumably due to a cardiac lesion. In case No. 4 respirations failed while the airway was adequate and before disappearance of reflexes. This occurrence represents the spasticity stage of asphyxia described by Flagg<sup>4</sup>. When excessive carbon dioxide is blown off during anesthesia administered by the open drop method, apnea without cyanosis may result. Failure to resuscitate the patient permits progressive anoxemia and disorientation of the vital centers.

Case No. 5 illustrates the need for prompt recognition and treatment of pulmonary complications occurring during the reactive period.

#### SPINAL ANESTHESIA

Among the deaths caused by spinal anesthesia, 6 were sudden and 1 resulted from a late complication.

Case No. 6. A 21 year old colored woman had a normal prenatal course and went into labor at term. Labor progressed slowly for twenty-five hours, at the end of which time pulse and blood pressure were normal. Twenty milligrams of pontocaine were injected at the third lumbar interspace. After the patient was draped for delivery, she gasped and died immediately. The time interval between introduction of the pontocaine and the patient's death was not stated.

Case No. 7. A negro woman, aged 32, had signs and symptoms of acute appendicitis in the eighth month of pregnancy. She was prepared for appendectomy, and 17 mg. of pontocaine were injected at the third lumbar interspace. Profound shock developed and the patient died within fifteen minutes after the anesthetic was given. A gangrenous appendix was found.

Case No. 8. A 24 year old colored primipara was first examined after the onset of labor at term. The blood pressure was 180 systolic, 110 diastolic,

and moderate peripheral edema was present. Examination of the urine showed the presence of albumen (2 plus). Demerol and scopolamine were given twice during labor. Delivery by cesarean section was elected, because little progress had been made after eighteen hours of good uterine contractions. Fifteen milligrams of pontocaine in 2 cc. of 5 per cent dextrose were injected at the fourth lumbar interspace. Circulatory and respiratory distress appeared immediately and the patient died two minutes after the administration of the drug. Living twins were delivered by post-mortem cesarean section.

Case No. 9. A white primipara, aged 20, gained 50 pounds during pregnancy. Examination forty-six hours after the onset of labor revealed moderately severe edema, a blood pressure of 140 systolic, 95 diastolic, and a pulse rate of 110. A diagnosis of cephalopelvic disproportion was made. After fifty-two hours of labor, cesarean section under spinal anesthesia was attempted. Morphine and atropine were given preoperatively, and 150 mg. of novocain diluted with 3 cc. of spinal fluid were injected between the second and third lumbar vertebrae. Respiratory and circulatory collapse occurred before the peritoneum was opened. Stimulants, oxygen, and cardiac massage were ineffective. A stillborn fetus was delivered post-mortem.

Case No. 10. A colored primipara, 36 years old, developed hypertension without albuminuria in the third month of pregnancy. By the eighth month her blood pressure was 190 systolic, 100 diastolic, edema was present, and the urine contained albumin (4 plus). She was treated with rest, diet, and sedatives. At terms convulsions developed, and she was referred to the hospital for cesarean section. Novocain, 150 mg., was introduced at the third lumbar interspace. Profound circulatory collapse developed rapidly, and she died before the incision was made. A living child was delivered by postmortem operation.

Case No. 11. A 21 year old white woman had had one child delivered by cesarean section because of a generally contracted pelvis. General physical examination in the ninth month of her second pregnancy was normal. Cesarean section under spinal anesthesia two days before the expected date of confinement was elected. At operation 10 mg. of pontocaine were introduced between the third and fourth lumbar vertebrae. The operation was begun, but before the uterine incision was made profound shock developed. A living child was delivered, but the patient died as the operation was being completed.

Case No. 12. A 30 year old white primipara had an uneventful prenatal course. Because of cephalopelvic disproportion, a cesarean section was done under spinal anesthesia before the onset of labor. Abdominal distention during the early postoperative period responded promptly to con-



servative therapy. On the seventh and eighth post-operative days the temperature rose to 101° F. The site of infection could not be determined and the fever subsided without specific treatment. On the eighth day the patient became depressed and noncommunicative. On the tenth day she had several convulsions. The head was drawn to the right, the neck was slightly stiff, and Kernig's sign was positive. A positive Babinski sign and ankle clonus were present on the right. The reflexes were hyperactive bilaterally. Spinal puncture showed a marked increase in pressure, which was not measured. The fluid was glazed in appearance and contained blood; the white cell count was 200 per cubic millimeter. The patient's temperature rose to 104° F. She lapsed into coma, and died after a convulsion on the twelfth postpartum day.

#### COMMENT

Cases Nos. 6 through 10 represent collapse following administration of the usual surgical dose of a spinal anesthetic agent for obstetric procedures. The dosage should be greatly reduced; in the pregnant woman the usual amount of the drug gives a high anesthetic level and may paralyze the muscles of respiration. Franken, as quoted by Greenhill<sup>3</sup>, reported 1 death in 139 cesarean sections performed under spinal anesthesia, as contrasted with approximately 1 death for every 3600 operations done under spinal anesthesia in nonpregnant individuals. Care should be taken to avoid giving the drug during or immediately before a labor pain, since the contraction may force the agent to a dangerous level. No mention was made in the records of these cases concerning the anesthetic level, the blood pressure immediately after the administration, or the use of vasopressor drugs before or during the anesthesia.

Cases Nos. 8, 9, and 10 were complicated by toxemia of pregnancy. They comprise one-half the number of deaths occurring under spinal anesthesia in this series. The sudden collapse frequently induced by a spinal anesthetic in toxemic patients justifies the inclusion of toxemia as one of the contraindications to spinal anesthesia.

Case No. 12 illustrates meningitis following an intraspinal injection. Fortunately this complication is rare, but the possibility is always present. It is important to recognize the condition promptly so that treatment may be instituted early.

It is significant that there were more deaths from spinal anesthesia than from ether anesthesia in this series, especially when it is realized that ether is given much more frequently than a spinal anesthetic.

#### INTRAVENOUS ANESTHESIA

Two patients died after having received sodium pentothal intravenously.

Case No. 13. A 29 year old white woman who had one living child and four abortions, began to have vaginal bleeding in the fifth week of her sixth pregnancy. On the fifth day of bleeding tenderness was noted in the lower part of the abdomen. The temperature was 99° F., the hemoglobin 11 gm. per 100 cc., and the WBC 14,700. Morphine, 10 mg., and atropine, 0.4 mg., were given prior to dilatation and curettage under intravenous anesthesia. The anesthetic agent was a 2½ per cent solution sodium pentothal; the total dose was not recorded. The patient did not react promptly from the anesthesia. Six hours later tachycardia and weakening of the pulse were noted, and death occurred within a few minutes.

Case No. 14. A 29 year old multipara with chronic rheumatic mitral valvular heart disease was digitalized in the eighth month of pregnancy because of cardiac decompensation. Her blood pressure was normal and there was no albuminuria. The hemoglobin was 10 gm. per 100 cc. Cesarean section was done under intravenous sodium pentothal anesthesia, supplemented by a small amount of nitrous oxide and oxygen. During the procedure evidence of shock was present. The patient failed to react from the anesthesia, and died twenty-four hours after the operation.

#### COMMENT

In view of the anemia in these patients, it is probable that the reduced oxygen-carrying capacity of the blood coupled with poor respiration exchange due to a relative overdosage of the anesthetic agent, was responsible for fatal anoxia. The central respiratory depression produced by pentothal anesthesia is in proportion to the amount of the drug administered.

#### LOCAL ANESTHESIA

One patient died following local infiltration with procaine.

Case No. 15. A 32 year old colored woman was operated upon in the eighth month of pregnancy because of placenta praevia centralis. Physical examination and laboratory studies prior to operation was normal, and blood loss had been negligible. Preoperative medication consisted of morphine and atropine. Local infiltration with a 1 per cent solution novocain was used for anesthesia. Cesarean section proceeded smoothly without un-

usual blood loss. Eight minutes following delivery, the patient had a convulsion and died almost immediately.

## COMMENT

Local anesthesia is one of the safest and most adaptable methods available for obstetrical cases at present. This case may represent the extremely rare occurrence of true hypersensitivity to procaine, although other causes of death such as air embolism cannot be excluded. Greenhill stated, "As far as I know, there has been no death of a pregnant woman delivered vaginally or by cesarean section, for which direct infiltration anesthesia with one-half per cent procaine was believed to be the cause."

## SUMMARY

Fifteen maternal deaths occurring in North Carolina between August 1, 1946, and May 1, 1948, have been attributed to anesthesia. All but 1 were considered preventable and could have been averted by proper precautions.

Five fatalities occurred with ether. The danger of allowing a patient to go into the labor room with a full stomach is illustrated by two deaths which resulted from aspiration of vomitus.

Six patients died of respiratory and circulatory collapse during spinal anesthesia. In all but 1, the dosage of the anesthetic agent was larger than that ordinarily recommended for obstetrical cases. Toxemia of pregnancy was present in 3 of these cases.

In 1 patient death from meningitis occurred twelve days after a spinal anesthetic administered for cesarean section.

Two women failed to react from anesthesia with intravenous pentothal.

Death occurring in 1 case a few minutes after local infiltration of a 1 per cent solution of novocain was attributed to drug reaction, although other causes could not be excluded. This death was not considered preventable.

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## HOGBEN PREGNANCY TEST

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RUSTON

For many years a great deal of attention has been devoted to the development or discovery of an easy and accurate pregnancy test. There have been a large number of different test animals used including mice, rats, frogs, fish, guinea pigs, and also various chemicals have been tried including prostigmin, histidine, and even human colostrum.

All pregnancy tests are based on the fact that pregnancy increases the manufacture of pituitary-like gonadotropic hormones. Therefore, these tests are really not tests of pregnancy itself, but for a certain hormone in a quantity which is usually due to normal pregnancy, but which may be present in a number of abnormal conditions associated with pregnancy, and even in some conditions without pregnancy.

Aschheim and Zondek developed the first successful test in 1928 when they observed that gonad stimulating substances appear early in the urine of human females, shortly after implantation of fertilized ovum. They used mice for their tests, which took a period of four days. Their test was 99 per cent accurate.

In 1929 Friedman modified this test, using rabbits, with an accuracy of 99 per cent. This test also took three to four days for completion. Other tests that have been used with varying degrees of accuracy include Kupperman's<sup>1</sup> two hour rat test, which is based on ovarian hyperemia in immature female rats after intraperitoneal injection of urine. Kupperman reported 99.5 per cent accuracy in 752 tests, but Bunde<sup>2</sup> was not so successful, obtaining only 90 per cent accuracy. He stated that

\*From the Green Clinic, Ruston, Louisiana.



the end point of the test was not sharp and there was too much tendency to report results as questionable. Guterman<sup>3</sup> developed the chemical test based on the pregnandiol in urine. Rickett's<sup>4</sup> test depended on histidine excreted in urine with 94.6 per cent accuracy. Use of prostigmin has been used with varying success—2 cc. injected daily for three days, and if the patient is not pregnant she menstruates in forty-eight hours. Mainini<sup>5</sup> has recently developed a test using the male frog. The urine is injected into the male frog and in two hours the frog's urine is examined for spermatozoa. He reports 99.5 per cent accuracy.

In 1930, Hogben<sup>6</sup> observed that the ovary of the female South African clawed toad, *Xenopus laevis*, contained eggs at all times but deposited these only on stimulation by the male. He also discovered that the injection of gonadotropin caused these frogs to deposit their eggs. Since then numerous authors have reported several thousand tests with accuracy from 96 to 100 per cent. All of the inaccuracies reported have been false negatives. The frog did not lay eggs, but later the patient proved clinically to be pregnant. Most of these occurred when the test was run sooner than forty days from the last missed period. Milton<sup>7</sup> found that a positive result may be obtained if the excretion of gonadatropic hormone is greater than 500 I. U. in a day—a condition that rarely occurs in absence of pregnancy and usually is manifest after the first two weeks of pregnancy. Oliver and Miller<sup>8</sup> found that their percentage of accuracy was higher when two frogs were used for each test rather than just one. Robbins, *et al*<sup>9</sup> point out that in conditions such as ectopic pregnancy in which viability of the products of conception may be impaired, or when the patient may be in the process of miscarrying, the hormone titer may be so low that false negative reactions may be obtained. Weisman<sup>10</sup> and his co-workers checked 154 cases with frog and rabbit, and in 148 both were correct. In the other 6, the test using a rabbit was incorrect and that with a frog was correct.

Since September 1946, we have been us-

ing *Xenopus* in our laboratory for the pregnancy test, and, to date, have run 154 cases with 81 positive and 73 negative. All of the positive tests proved correct clinically. Of the 73 negative tests 8 later proved to be pregnant, giving 89 per cent accuracy in negative, and an overall of 95 per cent. These 8 failures are given in detail below.

#### CASE REPORTS

Case No. 1. White female, age 20, para 0, gravida I. LMP October 3, 1946. Frog test negative November 5, 1946. Prostigmon test positive November 8, 1946. That is, after three injections of prostigmin, patient failed to menstruate. Delivered July 15, 1947.

Case No. 2. White female, age 25, para 0, gravida I. History of endometriosis four years. LMP October 23, 1946. Frog negative December 13, 1946; positive December 17, 1946. First test was not morning specimen and only 40cc. of urine. Delivered August 3, 1947.

Case No. 3. White female, age 25. LMP December 10, 1946. Negative January 16, 1947. Delivered elsewhere.

Case No. 4. White female, age 28. LMP January 6, 1947. Frog negative February 11, 1947. Was evening specimen after forcing fluids. Delivered October 18, 1947.

Case No. 5. White female, age 30. Para 0, gravida I. LMP January 1, 1947. Negative February 17, 1947; positive February 27, 1947. First was evening specimen. Delivered October 21, 1947.

Case No. 6. White female, age 19. Para 0, gravida I. LMP March 31, 1947. Negative May 5, 1947. Delivered January 10, 1948.

Case No. 7. White female, age 20. Para 0, gravida I. LMP April 14, 1948. Negative May 20, 1948. Delivered January 27, 1949.

Case No. 8. White female, age 20. Para 0, gravida I. LMP October 25, 1948. Negative December 2, 1948; positive December 9, 1948.

From these reports it is evident that all the false negatives are due either to specimens being obtained before the forty day period, or being other than the first morning specimen. Only one frog was used for the test. If positive, the frog was rested one month; if negative, the frog was rested for two weeks. We have used the test to differentiate tubal pregnancy from tumors, in checking fetal viability in threatened abortions, and as follow-up for metastases from chorio-epithelioma. We have been quite pleased with the test, chiefly because of the convenience, rapidity of the test, and the objectivity of the test. There is no

question about the test—you either have eggs or you do not—and the fact that test animals may be used repeatedly. The care of the frogs is very simple. They are fed once or twice weekly and the water is changed two or three times a week. One of our frogs has been used for 31 tests and another for 22 tests.

#### TECHNIC

Patient is instructed to restrict fluids after the evening meal, and bring in at least 100 cc. of the first morning specimen. If the patient is unable to bring the specimen to the laboratory within an hour, refrigeration is requested. The urine is acidified to pH of 4 by the addition of 20 per cent hydrochloric acid using bromcresol green indicator. Add 5 cc. of adsormone (kaolin suspension) and agitate for eight to ten minutes. Allow to stand until kaolin settles out to about 10 cc. Supernatant clear fluid is discarded and the remainder centrifuged, and the resultant supernatant discarded, being sure to get rid of all fluid. Add 5 cc. of 0.1 sodium hydroxide to residue and emulsify thoroughly. Centrifuge until supernatant fluid is clear. Save this supernatant fluid, pour into small test tube. Add 1 drop of 0.05 per cent phenolphthalein. It should turn purple. Add 1 drop 20 per cent hydrochloric acid. Mix and color should disappear. Take 2.5 cc. of this fluid in a 5 cc. syringe, use 25 or 26 gauge needle and inject into dorsal lymph sac of rested frog. Isolate the frog in a dark place and check in twelve to eighteen hours. We usually inject in the afternoon and observe in the morning. We have had a few frogs to deposit eggs thirty-six hours after injection and these were in very early pregnancies.

#### CONCLUSIONS

1. The *Xenopus* test is an easy and accurate test for pregnancy. A false negative may be obtained if the test is run before forty days after the last period.
2. False positives do not occur. The test is entirely objective.
3. In a series of 154 cases we had 81 positive with no false positives. Seventy-three were negative and 8 false. The over-

all percentage of accuracy for these tests was 95 per cent.

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## MATERNAL MORTALITY

### A TWENTY YEAR SURVEY AT TOURO INFIRMARY

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NEW ORLEANS

This study was undertaken to determine the incidence and causes of maternal deaths in a well managed general hospital, and to note what changes have occurred in the maternal mortality rate here and elsewhere during the past twenty years.

The obstetrical patients in this series were all white, and were all delivered in the hospital. Most of them had received adequate prenatal care, but a few were sent to the hospital as emergencies, having had little or no previous supervision.

\*Presented at a meeting of the staff of Touro Infirmary, Oct. 12, 1949, and at meeting of the New Orleans Gynecological and Obstetrical Society, Nov. 29, 1949.

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The professional care in this group of patients was dispensed by specialists, by general surgeons, and by the residents, under the supervision of the active obstetrical staff, where public ward cases were involved.

Neither ectopic pregnancies nor abortions are included in this study, since these conditions are classified in our hospital as gynecological. Most of the deaths occurred in well advanced pregnancy, though in the earlier years of the period surveyed, three patients died of hyperemesis gravidarum during early gestation.

The period of time involved here is from

TABLE 1  
MATERNAL MORTALITY AT TOURO INFIRMARY

	1929-39	1939-49	1944-49
Deliveries	8381	16,239	9673
Deaths	48	23	4
Mortality Rate	0.57%	0.14%	0.041%
Autopsies	15	12	2

TABLE 2  
COMPARISON OF TOURO INFIRMARY'S  
MORTALITY RATE WITH OTHERS

	1929-39	1939-49	1944-49
Touro Infirmary	0.57%	0.14%	0.041%
Hospital of the Good Samaritan <sup>1</sup> Los Angeles, Cal.	0.29%	0.08%	
Huntington Memorial Hospital Pasadena, Cal.	0.04%	0.07%	
Winchester Hospital <sup>2</sup> Winchester, Mass.	0.39%	0.11%	0.072%
New Orleans <sup>4</sup>	1.13%	0.27%	0.152%
Louisiana <sup>4</sup>	0.81%	0.32%	0.218%
United States <sup>4</sup>	0.59%	0.26%	0.16%
Specialty hospitals report their mortality rates as follows:			
Boston Lying-In <sup>3</sup>	1946 & 47	0.15%	
Chicago Lying-In <sup>5</sup>	1931-45	0.15%	
Margaret Hague <sup>6</sup>	1947	0.097%	
	1948	0.103%	

TABLE 3  
CAUSES OF DEATH

	1929-39	1939-49
Infection	15 31.2% of all deaths 1 per 558 deliveries 0.17% of all obs. cases 0.169% in U. S. (1937) <sup>7</sup>	4 17.3% of all deaths 1 per 4059 deliveries 0.024% of all obs. patients 0.073% in U. S. (1945) <sup>7</sup>
Toxemia	7 14.5% of all deaths 1 per 1197 deliveries 0.08% of all obs. cases 0.123% in U. S. (1937) <sup>7</sup>	4 17.3% of all deaths 1 per 4059 deliveries 0.024% of all obs. cases 0.051% in U. S. (1945) <sup>7</sup>
Hemorrhage	6 12.5% of all deaths 1 per 1396 deliveries 0.071% of all obs. cases 0.06% in U. S. (1937) <sup>7</sup>	4 17.3% of all deaths 1 per 4059 deliveries 0.024% of all obs. cases 0.035% in U. S. (1945) <sup>7</sup>
Cardiovascular-renal	8	0
Anesthesia	1 (sacral block)	5 (2 ethylene-ether 1 cyclopropane 2 ethylene)
Embolism, noninfective (all nonambulatory)	2	3
Hyperemesis gravidarum	3	0
Pyelonephritis	1	1
Pneumonia	2	0
(pre- and intrapartum)		
Acute Yellow Atrophy	0	1 (at 8½ months)
Diabetes	1	0
Typhoid (pre- and post-partum)	1	0
Tuberculosis, pulmonary	1 (died postcesarean at term)	0
Thrombocytopenic purpura	0	1 (terminal cesarean section)

January 1, 1929, to January 1, 1949. This span is particularly interesting since about midway in this era, the development and use of chemotherapeutic agents began, to be followed by antibiotics, blood banks, and many other important changes which have been responsible for making childbirth a much safer event.

During this twenty year period, there were 24,260 deliveries at Touro Infirmary. 71 mothers died, giving an over-all mortality rate of 0.28 per cent or 2.8 deaths per 1000 deliveries. Only one mother died who had given birth to twins.

The analysis of these deaths, considered from the standpoint of ten year periods (1929-39 and 1939-49), is given in table so that a comparison may be made.

TABLE 4  
CESAREAN SECTION MATERNAL DEATHS

	1929-39	1939-49	1944-49
Deaths	10	10	2
Low cervical sections	3	9	2
Classical sections	7	1	0
Total deliveries	8381	16,239	9673
Total cesarean sections	512	1448	937
Incidence of cesarean section	6.1%	8.9%	9.6 %
Mortality rate in cesarean section	1.9%	0.69%	0.21 %
Mortality rate in vaginal deliveries	0.48%	0.087%	0.02%

TABLE 5  
CESAREAN SECTION

Indications for cesarean section	Cause of maternal death
1929-39	
4 Failed test of labor (15-30 hrs.)	6 Sepsis
2 Eclamptic convulsions	2 Toxemia of pregnancy
1 Ruptured membrane for 3 days	1 Cardiovascular-renal
1 Cerebral hemorrhage (comatose)	1 Pulmonary tuberculosis
1 Pulmonary tuberculosis	
1 Repeat section	
1939-49	
2 Repeat section	2 Sepsis
2 Failed test of labor (1 after failure of forceps or version)	2 Hemorrhage
2 Abruptio placenta	2 Anesthesia (1 ethylene-ether 1 cyclopropane)
1 Placenta previa	1 Thrombocytopenic purpura
1 Elderly primipara (age 34 yrs.) and disproportion	3 Embolic, non-infective (all non-ambulatory)
1 Thrombocytopenic purpura (terminal)	1 air embolus on operating table
1 Undetermined	1 cerebral embolus on 1st p. p. day
	1 pulmonary embolus on 3rd p. p. day

It is apparent that the maternal mortality rate at Touro is considerably lower for the past ten years as compared to the period 1929-39. This improvement is even more remarkable for the past five years.

Table 2 shows a comparison of maternal mortality rates with other similar hospitals, and with the city, state, and nation.

Table 3 is an analysis of the causes of maternal deaths at Touro Infirmary during the ten year periods, 1929-39 and 1939-49.

Of the 71 maternal deaths, 4 patients died undelivered, 45 patients delivered vaginally, 20 cesarean sections were done before death, and 2 were done postmortem. Table 4 describes the 20 fatal cesarean sections.

It may be seen that the maternal risk in cesarean section is considerably more than in vaginal delivery. However, it must be stated that the cause for doing a cesarean section frequently is responsible for death rather than the operation itself, and also that cesarean section done late in labor after valuable time is lost is a poor risk. (See Table 5).

The increasing incidence of cesarean section has resulted from the increased safety of surgery, and our desire to electively section a patient when disproportion is apparent, and a traumatic delivery to be avoided.



## PREVENTABILITY OF MATERNAL DEATHS

The accurate determination of preventability in a maternal death is difficult when complete data from the attending physician are not available.

Many deaths that occurred in the earlier years of this survey had to be classified as "non-preventable" due to lack of the therapeutic facilities that we are fortunate enough to have at our disposal today.

It should be recalled, too, that the desire to avoid cesarean section and its risk ten or fifteen years ago, resulted frequently in vaginal deliveries that proved to be severely traumatic, or the performing of cesarean section late in labor, occasionally after forceps or version had failed.

Responsibility for preventable deaths does not always lie with the doctor, since the patient is occasionally guilty of self-neglect and its consequent penalty.

The hospital also must accept part of the blame for preventable deaths, where adequate preparation for meeting emergencies does not exist.

In brief, it may be stated that during the first ten year period (1929-39), 54 per cent of the maternal deaths were preventable, whereas during 1939-49, 34.5 per cent of the deaths were preventable.

## COMMENTARY

It is therefore, apparent that maternal mortality has considerably decreased all over the United States during the past twenty years, and this improvement is progressive. It is thought that the following constitute the chief reasons for this advance:

1. Better prenatal care. Not only providing better care, but publicizing its availability, and urging women to take advantage of earlier supervision. Improvement in this field can still be made, and the program of public education should continue to the point where complications and deaths due to self-neglect on the part of the patient are kept to an absolute minimum.

2. The development of chemotherapeutic and antibiotic agents. Deaths from sepsis have shown the most marked decrease of all causes, and since the use of these products, surgery can be done much more safely. Nevertheless, it must be remembered that these are not "cure-alls", and their use does not constitute a reason for taking unnecessary obstetrical risks.

3. Advances in hematology. The availability and greater use of compatible whole blood have been of tremendous value in reducing deaths due to blood loss. It is quite evident, even in our small group of 71 deaths, that available blood given in time and in sufficient amount, would have saved many of these mothers. Even with the free accessibility of blood from blood banks, insufficient replacement still occurs, and this problem has been well discussed by Lund and Brumfield.<sup>8</sup> They report the occasional indication and life-saving value of transfusions of 3500 to 7500 cc. of blood.

4. Improvement in obstetrical instruction in medical schools and hospitals. The need for better training in this specialty has been recognized, and much finer courses of instruction have resulted. The stimulating influence of the American College of Surgeons and the American Board of Obstetrics and Gynecology has played an important part in improving the practice of obstetrics. It is becoming more and more general for hospitals to limit the staff on the maternity floor to obstetricians.

5. More informative x-ray studies. A better understanding of pelvic architecture and more complete x-ray examination have led us to fewer traumatic deliveries, and have enabled us to establish a much more reliable prognosis as to the ability or inability to safely deliver a baby per vagina. Craniotomies, embryotomies, fetal fractures, and intracranial hemorrhage were complications seen all too frequently in the past, while today they are rarities.

6. Progress in anesthesiology. Better anesthetic agents and the technic for their administration have resulted in fewer deaths from this cause. Inhalation, intravenous, and spinal anesthesia have all improved. The latter, used extensively today, was thought to be quite dangerous in obstetrical patients a few years ago. However, to obtain these good results with spinal as well as any other type of anesthesia, a well trained anesthetist is essential.

7. Closer attention to statistics and the use of the "obstetrical conference". These have served to inform us of what is taking place in the field of obstetrics, and what phase of the specialty needs our special attention. Periodic inventory is an accepted practice, and maternal welfare has been materially improved by its use.

8. Psychotherapy. Undoubtedly, emotional disturbances have an effect on the dynamics of labor, and can give rise to such complications as uterine inertia, pathological contraction ring, and so-called "cervical dystocia". Walser<sup>9</sup> states that "tocophobia" (fear of pregnancy) is probably responsible for most cases of motor dystocia.

The fear factor seems to be subsiding somewhat, but is still quite prevalent. It is well within the power of obstetricians to cope with this matter if sufficient time is given during the prenatal period to explain to the patient in simple terms what is taking place within her body, and what to expect from a normal pregnancy. Her questions should be encouraged and answered in such a manner that she feels completely satisfied. "To be forewarned is to be forearmed", and proper prenatal instruction will save the patient much needless worry, and the obstetrician much valuable time. To go into labor with the utmost confidence as to a successful outcome is one of the basic principles of physiologic childbirth, as popularized by Grantly Dick Read. Prenatal classes have been an important step in the proper preparation of the patient for a successful pregnancy and labor.

These previously mentioned eight factors have been chiefly responsible for the

marked and progressive lowering of the maternal mortality rate in this country. In 1933, the U. S. ranked eleventh among the leading nations in maternal mortality with 6.2 deaths per 1000 live births. In 1947, the rate was 1.3 and "we probably rank close to the lowest record of any nation".<sup>10</sup> This is a record of which we may truly be proud, but vigilance must continue if our improvement is to persist.

It must be borne in mind that reproduction is a normal physiological function, and certainly the loss of life, especially when it is preventable, should not be a penalty for performing this function.

#### SUMMARY

1. Statistics on maternal mortality at Touro Infirmary for the past twenty years are presented.

2. Statistics on maternal mortality from other sources are presented for comparison.

3. The causes of death, methods of delivery, and an analysis of cesarean section deaths are shown.

4. The preventability rate in this series of 71 maternal deaths is noted.

5. The eight important factors responsible for marked improvement in maternal mortality incidence are discussed.

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## STUDIES OF THE DIETS OF PREGNANT WOMEN IN MISSISSIPPI:

### I. THE INGESTION OF CLAY AND LAUNDRY STARCH

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NEW ORLEANS

AND

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The consumption of clay and laundry starch by a group of pregnant women studied is found to be so common and the practice so little known that the phenomenon merits a report. Because clay and starch are about equally popular constituents of the diet and neither is established on a physiological basis, we are discussing them jointly. It is hoped that this and subsequent reports will focus attention on the nutritional poverty of the group studied.

#### REVIEW OF LITERATURE

There is a voluminous literature on geophagy. Comparatively little has been added in recent years in America. Laufer<sup>1</sup> in 1930 collected the world's record of earth-eating. It has occurred sporadically for centuries in almost every section of the globe. Some of the uses of earth have been in famine to allay hunger pains, as a condiment or relish, a remedy, a part of a religious ceremony, or a delicacy devoured for its own sake. Qualities that have recommended earths are color, odor, flavor, softness, and plasticity. Usually they were fine, ferruginous clays. "Clay", "dirt" and "earth" were used synonymously in the literature, by the patients reported here and in this essay. The clay was consumed in its natural state or baked. Examples of identical earth-eating habits were found in peoples from regions so diverse that the ethnologist bowed to the physiologist, the psychologist, and the biochemist for an explanation. It appeared to have no relation

to climate, race, creed, culture areas, or degree of culture. The habit was individual and not tribal. Abstainers attempted to dissuade partakers. Imitation has been a motivating factor.

Laufer further reported from several sources the cravings of the pregnant for clay, particularly in Melanesia, India, and parts of Africa. These women were, in general, inclined to clay-eating whether pregnant or not, but during gestation the custom appeared intensified. It is known that slaves brought the custom with them from Africa. Among the modern African natives geophagy is reported common.<sup>2</sup> Thurston<sup>1</sup> and Gelfand<sup>2</sup> remarked that the natives in both India and Africa were ashamed to let the white man know of this habit. We encountered a similar reluctance. The consumption of earth by animals is wide-spread.<sup>3</sup>

Dickens and Ford<sup>4</sup> in a well controlled questionnaire submitted to 207 Mississippi school children above the third grade, found that 25 per cent had eaten earth in a ten to sixteen day interval preceding the interrogation. Five samples taken from clay banks where people had been seen procuring dirt were analysed by soil specialists at Mississippi State College, but no conclusions could be reached. Some reasons proffered for eating clay were: "it is good for you"; "tasted good, rather sour, like a lemon"; "helps women who are pregnant". They, like us, turned up stories of mailing clay to the North, by request, to migrated relatives and of walking considerable distances to banks where clay was particularly "good".

Hertz<sup>5</sup> commented on clay and starch-eating among negroes in an urban community in North Carolina. She stated that it is common but provided no figures. None of the women she interviewed knew of a man who ate starch or clay. She made the observation, which may be important, that although clay and starch did not taste alike, the "feel" in the mouth was similar. The sensation was described as dry and "crumbly". The authors vouch for this description.

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## BACKGROUND OF THE PATIENTS

The subjects of this study were women given antepartum care at the county health units of the Mississippi State Board of Health. Eleven counties in southern Mississippi were represented. All of these women were from the lowest economic and educational level in the area. Ninety-two per cent were negro. In 1947, 49 per cent of the population of Mississippi was colored. The average time spent in school by colored inhabitants of Mississippi is 4.7 school years.

The composition of the diet of these patients when reported by the authors will disclose a variety and quality among the poorest described in the United States. Using the admittedly high National Research Council's recommended daily allowances of specific nutrients in pregnancy as criteria for classifying the diets, 6 per cent were adequate and 94 per cent inadequate.

A preponderant number of these women were rural and the remainder had retained their rural dietary habits. The rural population totals 80 per cent of the inhabitants of the state.

Although the incidence of midwife delivery in Mississippi is 36 per cent, this group was to be attended by midwives in an incidence closer to 90 per cent. A survey of anemia in pregnancy from the same source of patients, now nearing completion, will describe unusually low average hemoglobin levels. The leading cause of maternal deaths in this state is toxemia of pregnancy. In 1947 there were 176 maternal deaths in the state. By death certificate it was established that 76 died from toxemia, 36 from hemorrhage and 14 from infection. An intensive investigation of 47 consecutive maternal deaths in south Mississippi substantiates this ratio in the causes of maternal deaths. The maternal death rate in Mississippi was 4.0 per thousand live births in 1945, 3.2 in 1946 and 2.6 in 1947. Despite this creditable decline in the death rate, the fact remains that the prospects of child bearing here are not enviable when compared to other states.

## INCIDENCE

This information was turned up in the course of a detailed study in 1948 of the diets of 361 pregnant women. Trained nutritionists including one author, A. G. K., obtained diet histories of unselected patients. This was a one-day food record using the personal interview method. The patient was put at ease by a chatty conversation concerned with diet and high food costs. Confidence was soon found to be essential, as many patients were embarrassed about their clay-eating and disinclined to admit to the practice. Hence, we feel that the true incidence is higher than that quoted in this report.

The incidence of clay and starch-eating in the group studied is shown in Table I.

TABLE I  
TOTAL PATIENTS STUDIED  
(361)

	Starch Clay	
	Starch	Clay
Colored (331)	41% (136 patients)	27% (89 patients)
White (30)	10% (3 patients)	7% (2 patients)

Three hundred and sixty-one patients were investigated, 331 colored and 30 white. Of the colored, 27 per cent were eating clay and 41 per cent starch. In the white group 7 per cent consumed clay and 10 per cent starch. A few of these women ate starch and clay when not pregnant, but the quantity and incidence were dwarfed by the habit in the gravid state.

To obtain an idea of the habits of the general population, 270 patients were asked if their husbands ate clay or starch and none gave an affirmative answer.

The amount of starch consumed ranged from 2-3 small lumps to 3 boxes (24 oz.) per day. Several ate 1-2 boxes a day. The amount of clay was from 1 tablespoonful to 1 cupful per day.

Reports from other observers and these patients have disclosed that clay and starch enjoy popularity outside of Mississippi, at least in the South, or among people recently migrated from the South.



## DESCRIPTION OF THE CLAY AND STARCH

The earth consumed by these patients differed widely in appearance and source. That usually referred to as "clay" was preferred. It was fine, slimy in consistency, and contained but little sand. Red and gray clays were the favorites. It was usually eaten in the dry state. Erosion and stream banks were favorite sources. Banks exist which are a favorite in a family or a neighborhood.

The starch eaten is the Argo laundry starch. This is practically the same as the Argo cooking starch, the main difference being that the laundry starch is in the lump form and the other is a powder. Other than the starch present, the Corn Products Refining Company lists the following analysis of the product: protein, .25 per cent; ash, .10 per cent; iron, .0005 per cent; fiber, .10 per cent; acidity, .06 per cent; pH 5, No reagents are added. It is produced directly from the corn by the wet milling process and subsequent separations.

## REASON FOR EATING CLAY AND STARCH

We are concerned here chiefly with the reporting of this perverted appetite and do not possess the means to adequately investigate the causality. An extended delving into physical, psychic, and ethnological factors would be needed to do justice to uncovering the incentive forces.

Laufer quoted Ehrenburg as having analysed many hundreds of specimens of edible earth without coming to a conclusion. Laufer further stated that the common explanation given by primitive peoples when pressed for one was that it was good for them. Hertz had samples of popular clay in North Carolina analysed by a geologist but no leads were furnished.

In this series of patients there seemed to be no relation between the quality of diet and the incidence of clay-eating. When the diets of clay-eaters and starch-eaters are classified as adequate and inadequate the percentage in each classification is approximately the same as in those who did not eat clay or starch. No relation is found between the incidence of starch-eating and the calorie intake.

There are suspicions cited in the literature of dirt-eating causing various maladies including anemia and tetanus.<sup>1, 6</sup> They seems to be based on thin evidence and lack confirmation of studies by others. We are not aware of ill effects from clay-eating in our group of women.

Numerous attempts have been made to connect geophagy and hookworm infestation.<sup>2</sup> Although clay-eating can cause ankylostomiasis, it is not the usual mode of infection. Ankylostomiasis as a cause of geophagy has not been convincingly demonstrated. A number of the women reported here have had stools examined with negative results. It is unusual to find hookworm in the Mississippi negro, it being one-twelfth as prevalent as in the white.<sup>7</sup>

Efforts by others to correlate specific dietary deficiencies and soil consumption have to date failed. A few have ascribed the eating of earthly substances to a need for salt. This seems improbable as it has been demonstrated that the clays consumed contained none or a negligible quantity and most of the eaters have had access to salt.

It is tempting to suggest a relationship between the hemoglobin levels in these patients and the ferruginous quality of the clays but we have no evidence of such an association.

It is the personal impression of the authors and the nutritionists who assisted in the compiling of the data that these women eat clay, in addition to whatever other reasons there may exist, because they like the taste of it. The mores of the group from which these patients spring do not dictate strongly against this habit. Starch, being next to tasteless, we cannot fathom why it is eaten, especially by the patients with a good diet. We believe that the laundry starch is eaten instead of cooking starch because its lump form makes it easier to eat out of a box, which is the customary way that it is consumed.

Every physician knows stories of women who have acquired uncommon tastes in pregnancy and have satisfied those inclinations. The particular form reported here may be another manifestation of the curi-

ous turns the taste of a pregnant woman may take. The dirt-eating proclivities of children are known to all.

Some direct quotations from interviews with these patients are here added to help complete the picture of this remarkable practice:

"I craves it." "I know it is not good for me, but I like the taste." "Just have a taste for it." "See'd other people eat it." "I eat dirt just the same way you would smoke a cigarette." "Because it's really good." "When I get worried about by children I eat more dirt." "I crave something sour like the taste of clay." "If I don't eat dirt or starch I want to throw my food back up." "It seems to settle my stomach." "I reckon I eat too much of it." "I know it's not good for me." "I know I shouldn't eat it." "I have to slip and eat it without letting my husband know it." "My husband won't let me eat it." "When I go up in Jasper County I get it, but can't find any good dirt here." "This Biloxi dirt ain't no good, so I gets my sister in Birmingham to send it to me." "I have to go to the country to get it and I can't go often because I can't leave the children." "Some people say it has a lot of germs so if it does I try to kill it and bake it in the oven." "Either I bake it in the oven or let it dry in the sun." "I used it with all my children." "You ought to taste that stuff (dirt). It sure is good." "I get up in the night and eat it." (starch). "Why do I crave that stuff? I want to quit it but can't." "I used to eat two boxes of starch a day. Now only a box." "My husband fusses about it." "I never heard of a man eating dirt. They not got the same taste a woman has. They not like a woman." "I lets it dry for a couple of months and keeps it in the corner in a syrup bucket by the chifferobe." "I keep it on the mantel in a box." "My mother eats it because she be's in the change and they say it will help her." (dirt). "They need starch to make bones and teeth." (statement made by midwife). "When I was a child I was coming home from Sunday School and it had rained. I could smell the dirt on the bank and started to eat it then. Have kept it up." "Sometimes I stop eating it for about a month, then the taste comes back." (dirt). "I would eat more dirt than I do, but I have a hard time getting it. I have to slip from my husband and also have to go to my mother's to find the right kind."

#### SUMMARY

In a dietary study of 361 rural Mississippi pregnant women, 25 per cent included clay in the diet and 39 per cent laundry starch. The patients were from an economically and medically underprivileged group and 92 per cent were negro. The lit-

erature on clay and starch-eating is reviewed. The reason clay and starch are eaten is unknown.

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## MALE INFERTILITY\*

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NEW ORLEANS

The purpose of this paper is to clarify some of the problems related to the management of male infertility and to attempt to eradicate a few of the deep-rooted misconceptions about this condition.

It is a regrettable fact that the investigation of the sterile male is frequently limited to microscopic examination under the high-dry objective of a drop of seminal fluid from a condom specimen. If the field appears to be occupied by numerous motile spermatozoa, the husband is exempted from responsibility of his barren marriage. However, if the examiner deduces that the drop is not quite up to standard, oligospermia is diagnosed. Thereafter, treatment consists of hormone injections, huge doses of vitamin E, and thyroid medication. If no improvement is evident, or pregnancy has not occurred after several months of this routine, the couple is indoctrinated with the philosophy of child adoption. Sometimes, the husband is referred to a urologist for further study.

#### SCIENTIFIC APPROACH TO MALE INFERTILITY

I wish to present a more logical and scientific approach to male infertility. This

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\*\*From the Department of Urology of the Louisiana State University School of Medicine, Charity Hospital of Louisiana, and Touro Infirmary, New Orleans.



technic has been repeatedly demonstrated to be more economical in the total expenditure of time, effort, and money, and furthermore, promises a greater incidence of success.

In the initial consultation with the sterile male, a complete history and physical examination are absolutely necessary. This oft repeated recommendation merits further repetition because the key to the solution of the patient's problem is frequently overlooked when the examiner focuses his interest away from the patient in general and concentrates on the drop of seminal fluid in particular. One cannot afford to overlook the past and social histories which can contribute considerable information to the ultimate clinical impression. For example, inquiry into the assignment of a man who was a veteran of World War II revealed that he was an x-ray technician who frequently ignored basic precautions in favor of comfort and expediency. Inquiry into the sexual habits of one patient revealed that this tired business man practised coitus only once or twice monthly; all other factors being normal, the treatment was self evident. Tobacco and alcohol are known to exert depressing effects on the germinal epithelium, so that the question of excessive use of either of the substances must be established.

A thorough physical examination obviously includes a search for clinical evidence of endocrinopathies. It is equally important to appraise each body system with care. Pulmonary tuberculosis is not uncommonly responsible for depressed spermatogenic activity. One man, referred to me after many months of futile endocrine treatment for oligospermia, enjoyed a complete return to a normal sperm count four months after the surgical removal of chronically infected tonsils and no other treatment. Methodical examination of the genitalia is essential, but the limitation of the physical examination to palpation of the testicles and prostate gland is shortsighted and incomplete.

Next to be considered are laboratory data. A routine urinalysis, including examination of the centrifuged sediment, is

an absolute necessity. In this connection, attention is invited to the knowledge that diabetes mellitus and nephritis are capable of being exclusively responsible for sterility. The prostatic secretion should be investigated for the presence of pus. There is no factual evidence to support the practice of utilizing the findings in the secretions of the prostate gland and seminal vesicles as an index of spermatogenic function. A serological test for syphilis is performed routinely.

We are now ready for examination of the semen. Collection of the seminal fluid is made five days after sexual abstinence. This figure is based on the results of numerous investigations which have revealed that spermatozoa reach a peak under these conditions. This is a point worth remembering in advising couples in the matter of conception when the time of the wife's ovulation has been reasonably well determined.

The time-worn custom of collecting condom specimens, later fastened with adhesive tape to the chest to keep the specimen warm, is mentioned only to be condemned. It is now known that the unwashed condom contains benzine compounds and dusting powder, both of which impair sperm motility and will even distort cell structure. Latex itself has a similar effect. It should be noted that the washed condom is not a satisfactory alternative because it does not remove all of these injurious effects; in addition to this, the remaining few drops of water are a source of error because they are not isotonic with the semen. Furthermore, motility studies are made at room temperature and not body temperature.

#### METHOD OF TESTING SPECIMEN

The best method is to have the patient obtain the specimen by masturbation into a scrupulously clean and dry glass container. The following laboratory tests are performed preferably within one hour following collection of the specimen:

1. *Volume*: A 10 cc. graduated pipette is used to determine the volume of seminal fluid. The normal range is between 1.5-6.0 cc. The amount of the ejaculate is important for at least two reasons. First, a

subnormal ejaculate volume will produce only a small vaginal pool and thereby reduce the possibility of intimate contact with the cervical os. Second, low pH of acidic vaginal secretions are not neutralized by the buffering agents of small ejaculates. The effects of the unaltered acidifying effects is reduction in sperm activity.

2. *Viscosity*: The viscosity can be rapidly determined by immersing the end of a wood applicator in the specimen and noting the tenacity of the fluid as the stick is withdrawn. Unusual viscid ejaculates are of significance when it is obviously responsible for slowed spermatic activity of an otherwise normal semen specimen. Inexpensive viscosimeters are available for exact studies.

3. *Motility*: Motility is checked by observing the percentage of active spermatozoa, the degree of aggressive movement (i.e., rapid or sluggish), and the duration of motility. No motility is evident in a freshly ejaculated semen specimen until liquefaction has occurred within about ten minutes. Decline in the activity of sperm does not normally commence for about three to five hours. At the end of twenty-four hours, some movement should be evident in a few spermatozoa.

In addition to this test, I have been using routinely the Weisman test which is designed to determine the ability of spermatozoa to survive in an acid environment simulating the pH of the vagina. A 10 per cent lactic acid solution is buffered with 2 per cent sodium hydroxide and diluted ten times. This is added drop by drop to 0.5 cc. of the fresh semen specimen until the pH of the latter falls to 5.5 (nitrazine paper). Vigorous healthy sperm will retain their motility up to three hours under these conditions. Defective spermatozoa are rendered immotile in a much shorter time.

4. *Cell Count*: This significant determination is accurately and easily performed in about five minutes. The required equipment is a white blood cell pipette, an ordinary Neubauer counting chamber, and a couple of ounces of diluent consisting of 1 per cent phenol in a saturated solution of

sodium bicarbonate. The semen is drawn up to the 0.5 mark and the remainder of the pipette is filled with the diluent. The pipette is then rapidly agitated for one minute. Then flood the counting chamber as for a blood count. Count the number of sperm in five blocks (80 squares). Add 6 zeros to the total. The final figure represents the number of sperm per cubic centimeter.

Most highly fertile men have counts over 100 million per cc. Meaker stipulates that pregnancy rarely occurs where the count is under 60,000,000 per cc.

5. *Morphology*: There are too many opportunities for error in studying only wet specimens for abnormal cell structure. The stained smear offers the only accurate means of noting sperm morphology. For routine office procedures, a simple smear, lightly fixed with heat, and stained with a Gram stain is satisfactory. Apropos of this technic,—it is not known why some sperm take Gram positive stain and others reveal a Gram negative appearance.

Hotchkiss suggests the following classification for routine morphological studies:

1. Normal or Oval
2. Tapering
3. Round
4. Duplicate
5. Giant and Pinhead
6. Amorphous

More than 10 per cent abnormal forms are thought by many workers to be conducive to infertility.

#### HYALURONIDASE

In 1928, a mucinolytic enzyme contained in spermatic fluid was discovered. This substance, hyaluronidase, is manufactured in the body exclusively by the germinal epithelium of the testes. It has been theoretically estimated that the amount of hyaluronidase contained in 20 million spermatozoa is essential for follicle dispersal. This may possibly explain the need for vast numbers of sperm to assure fertility. The importance of hyaluronidase in male sterility is suggested by the existence of cases of infertility in whom the sperm count, motility, and morphology are nor-



mal. The addition of hyaluronidase by direct application to the cervix has not given encouraging results as yet.

#### TESTICULAR BIOPSY

The testicular biopsy is a harmless and easily performed procedure which does not require hospitalization or special surgical equipment. The degree of discomfort experienced by the patient is not any worse or more incapacitating than that suffered by his wife when subjected to a Rubin test. Histological examination of the testicular substance enables the examiner to obtain an accurate estimation into the type and degree of pathology present in the germinal epithelium. It furthermore permits certain deductions relevant to the feasibility of endocrine and other types of therapy.

#### CONCLUSIONS OF CHARNY

Considerable guidance is obtainable from the conclusions of Charny who has performed a monumental piece of work in correlating several hundred thoroughly worked-up cases of male sterility with testicular biopsies in these patients.

1. Endocrine deficiency is responsible for less than one-fifth the cases of male sterility.

2. Endocrine therapy is ineffective in patients with subnormal semen properties if their testicular biopsy reveals end stage degenerative changes.

3. No efficient treatment has ever been found for patients who present primary testicular pathology.

4. Response to endocrine therapy has been satisfactory only in those cases in which the germinal epithelium is otherwise normal except for incomplete cellular development resulting from either faulty or inadequate hormonal stimulation.

An abundant enthusiasm has arisen in the past several years directed toward the use of vitamin mixtures, particularly A and E, in the treatment of sterility. There is no conclusive acceptable experimental proof that these vitamins are capable of stimulating spermatogenesis in healthy and

well nourished human males whose germinal epithelium is either nonexistent or mal-developed. One need only consider the marked fecundity of the undernourished natives of China and India to appreciate the questionable validity of the farfetched claims made for prescribing huge doses of tocopherols and the other vitamins. The role of the vitamins in maintaining the overall nutritional balance is not denied. But the vitamins should be regarded as contributing factors to the general well being and not possessing specific spermatogenic properties.

Thyroid therapy is considered by many clinicians to be one of the most important drugs available for the treatment of male sterility. This implicit faith in the ability of thyroid substance to produce spermatogenesis is not substantiated by experimental findings and clinical experience. For example, thyroidectomized rats suffer no interference with spermatogenesis. Hamblen and his co-workers have observed no disparity in the semen studies of men whose BMR's are plus or minus 10 when compared with men of normal BMR readings. In fact, men with much lower metabolic rates had surprisingly excellent sperm counts. It therefore seems incompatible with sound scientific fact to prescribe thyroid drugs to healthy males with no metabolic disturbances for the purpose of stimulating defective germinal epithelium.

In the past several years, testosterone has come into vogue as a means of stimulating germinal epithelium. This should be regarded as risky treatment in the face of repeated demonstrations in humans of the production of oligospermia and even azoospermia following short courses of male sex hormone therapy.

#### CONCLUSION

In summing up the facts pertinent to male infertility, there are a few salient points which should be the guide posts to accurate diagnosis and treatment.

1. A complete history and physical ex-

amination for the purpose of ferreting out and eliminating all extratesticular pathology which might conceivably depress spermatogenic function.

2. Realization that less than one-fifth of the cases of male sterility are caused by endocrine deficiency.

3. A healthy scepticism for many drugs, hormones, and vitamin mixtures which are already possessed in full measure by the healthy and well nourished male, and are therefore destined to prompt detoxification and elimination by the liver and kidneys.



# NEW ORLEANS Medical and Surgical Journal

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## ELIGIBILITY FOR TREATMENT IN THE STATE CHARITY HOSPITALS

The problem of who should be eligible for treatment in the State Charity Hospitals is one which concerns the taxpayer and the physician. It was currently reported (on March 3, 1950, in the daily press) that the State Hospital Board has received complaints from doctors and Parish medical associations to the effect that charity is being granted to all applicants. It is further stated that the protests were received particularly from Lafayette, Tangipahoa, and Jackson Parish doctors. Upon receipt of such protests the Board voted to ask "the Louisiana Medical Society, the Louisiana Dental Society, the Louisiana Hospital As-

sociation and any other interested citizens or groups of citizens" to meet with it in Baton Rouge, May 3, for a final decision on the rules which will determine who is eligible to receive Charity treatment.

It was stated that the criteria under consideration by the Board, drafted for consideration and suggestions by the public and interested agencies, are as follows:

"1. Recipients of public assistance shall be considered eligible for hospital and clinic care without further certification.

"2. Any person whose annual income does not exceed the following financial scale is automatically eligible for hospital care, provided he does not have hospital insurance covering cost of illness.

"Single person—\$1020.

"Couple—\$1320.

"Couple with one child—\$1500.

"Each additional child or dependent—\$180.

"3. If any person's income exceeds the financial scale he may be declared eligible for hospital care under the following conditions:

"A) Whenever the patient shall be the wage earner of the family and the illness will result in a (total or partial) loss of income for the period of illness.

"B) Whenever the probable cost of diagnosis and extent of illness shall be so great as to be obviously beyond the person's ability to pay.

"C) Whenever a person's income does not exceed \$5000 annually and he can produce reasonable evidence that he has already spent 10 per cent or more of his annual income for medical expenses.

"D) Whenever a person's income exceeds \$5000 annually and he can produce reasonable evidence that he has already spent 20 per cent or more of his income for medical expenses.

"E) Whenever a member of the family shall be chronically ill and the cost of medical care would place a financial strain on the family resulting in deprivation of the necessities for other members of the family.

"F) Whenever the family has debts and financial obligations incurred prior to medical need that make payment of nominal medical costs a financial strain on the family.

4. Each case shall be considered individually and on its own merit in regard to family income, liabilities, and responsibilities."

The State Hospital Board is to be commended for taking note of the communications from Parish societies and physicians, and for calling into conference representatives vitally interested in the decisions to be

reached. This is a matter in which all should be concerned. Physicians should make themselves familiar with all the provisions in the criteria given above. In deciding this problem, all should remember that Louisiana is highest in per capita taxation and among the lowest (thirty-ninth) in per capita income. It should also be remembered that Louisiana has for years maintained a ratio of free hospital beds to population which is high in comparison with other states.

Responsible students of economics state that under free enterprise when government in direct or hidden taxes takes a total of 29 per cent of national income, the crisis is reached. At this point a depression starts unless it is deferred by inflation. The national tax bill is variously stated as being between 25 and 29 per cent of income. The Louisiana tax bill is 50 per cent above the average. It is clear then that an increase in the rate of taxation will of necessity soon initiate a depression. An increase in either the number or size of our state hospitals is not practicable since this money should not be provided by additional taxation, and would have to come from funds presently allotted to some part of luxury government.

It is the desire of the responsible tax-paying citizens of the community that the facilities of the Charity Hospitals of the State should be used only by those who cannot pay for these services. With this, organized medicine is in agreement. It is not the wish of either that they should be ex-

panded to establish gradually state medicine. On the contrary, admission should be restricted to exclude those who can pay, and thus, make the facilities available to those who cannot. When one considers the various items in the rules of eligibility for admission, it is thought that the scale indicated in the first two items is reasonable. Reflection upon the operation of item No. 3 brings considerable doubt in the minds of those who are familiar with the operation of such hospitals as to how these various items, "A" to "F" included, could be administered. Section "A" would cover considerably more than one half of the population. Section "B" is somewhat indefinite. Sections "C" and "D" are difficult, and possibly impossible of proof and application. Sections "E" and "F" would probably not work an injustice to any, if administered in a situation in which there is complete impartiality and an adequate presentation of facts. The final item, labeled "4," is the one which would apparently give either the hospital authorities or the patient complete freedom of action.

Rules of this type, it is recognized, are difficult to formulate, and even more difficult to administer. It is to be hoped, however, that when this matter comes up for consideration that due care will be given, in order to accomplish the primary objects for which the state system of Charity Hospitals was set up, and to prevent those who can pay from crowding out those who cannot.

## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### SPECIAL NOTICE

Every effort has been made by the Chairman of the Committee on Hotels for the 1950 Annual Meeting to be held in Baton Rouge, April 24-26, to secure reservations for members making requests. Unfortunately, on February 10, the manager of the Heidelberg Hotel advised the Chairman,

Dr. Edward G. Cailleteau, that no more rooms were available. It is hoped that confirmation of the reservations requested up to that date has been received by all applicants for rooms.

Dr. Cailleteau has advised that he will attempt to place other doctors submitting requests for reservations, in tourist courts.



## A WELCOME TO BATON ROUGE



Baton Rouge, the Capitol of Louisiana, is prepared to welcome members and guests in attendance at the 1950 Annual Meeting of the Louisiana State Medical Society April 24-26. The City is accessible by plane via Delta and Eastern Air Lines, by railroad via Illinois Central System, Louisiana and Arkansas-Kansas City Southern Railway, Missouri Pacific Lines, and Texas and Pacific main line interconnection just west of the Mississippi River. In addition, four United States highways lead to Baton Rouge.

When not attending sessions of the State Society meeting, doctors and their wives may find ample diversion and recreation. There are two excellent golf courses, moving picture houses and other entertainment facilities in and around Baton Rouge. In addition there are churches representing many faiths, which members may wish to attend on Sunday preceding the meeting.

Make your plans to attend this meeting of the State Medical Society and accept a warm welcome from the City and the doctors of the East Baton Rouge Parish Medical Society.

There are several very fine courts just outside of Baton Rouge with very good accommodations, and it is hoped that the doctors will find these satisfactory. The question of room accommodations in Baton Rouge has proved a serious problem which has

been handled very capably by Dr. Cailleteau and his committee. It is regrettable that all members could not be placed at the headquarters hotel, and it is hoped that the doctors will understand the difficulties encountered.

## LET'S DO SOMETHING ABOUT IT

The fifth Rural Health Conference, under the sponsorship of the American Medical Association, was held in Kansas City, instead of Chicago, under the able leadership of Dr. F. S. Crockett of Lafayette, Indiana.

It was generally agreed that this was the most satisfactory of all the Conferences held to date. All groups interested in rural health were represented among the five hundred or more who attended. These included doctors, dentists, nurses, farm bureau people, the grange, the press and many other interested groups.

The program was arranged a little differently this year than in previous years. The general theme was "Let's Do Something About It", carrying out the thought that we have been making plans during the past four years for rural health and now is the time to really start giving people in rural areas better medical care.

The subject was divided into five topics, each one being introduced by a general speaker in the first morning session. These were as follows:

**LET'S DO SOMETHING ABOUT IT**—F. S. Crockett, M.D., Chairman Committee on Rural Health, A.M.A., Lafayette, Ind.

**RURAL MEDICAL FACILITIES AT THE LOCAL LEVEL**—Paul C. Johnson, Editor, *The Prairie Farmer*, Chicago, Ill.

**RELATION OF AGRICULTURAL EXTENSION SERVICE TO RURAL HEALTH PROBLEMS**—Lewis Webster Jones, Ph.D., President, University of Arkansas, Fayetteville, Arkansas.

**COMMUNITY RESPONSIBILITY FOR HEALTH SERVICE IN RURAL AREAS**—John Brandt, President, The National Milk Producers Federation, Minneapolis, Minnesota.

**METHODS OF PREPAYMENT FOR HEALTH SERVICES IN RURAL AREAS**—J. P. Sanders, M.D., Vice President, American Academy of General Practice, Shreveport, Louisiana.

**THE RESPONSIBILITY OF THE MEDICAL SCHOOLS IN THE RURAL**

**HEALTH PROGRAM**—Franklin D. Murphy, M.D., Dean, University of Kansas School of Medicine, Kansas City, Kansas.

The afternoon sessions went into general study of these same subjects and were divided into two groups and certain conclusions were drawn from their discussions on Saturday morning, February 4. The section chairman brought back the results of their respective meetings.

The whole theme was carried out with the idea in mind of getting better medical care to rural people and the conclusions reached all led to one general understanding. That was as follows: Good medical care must start on the community level with all agencies interested being represented and working cooperatively. It was generally conceded that in some way the community should furnish the physical facilities for good medical care, buildings, equipment, and even local allied medical personnel would probably be best provided by the community. It was emphasized that the medical schools, the hospitals, and the medical profession in general, should stimulate more young men to enter the general practice field. It was agreed that the doctor should have a favorable environment in which to live. His wife should be happy in her surroundings and their children should have equal facilities with those in the city.

The Conference came to an end after a luncheon at noon Saturday, following a lengthy discussion on "Continuous Selling" by Dr. Kenneth McFarland, Superintendent of Schools, Topeka, Kansas. He insisted that good public relations must start in the doctor's office and with his own patients. That good health must be ever in mind in each and every person's thinking and, in general, we should never stop selling the idea of free enterprise and good medical care to the people who are interested.

The Louisiana Rural Health Committee was represented at the Conference by Dr. Guy R. Jones, Chairman, of Lockport; Dr. M. C. Wiginton of Hammond, and your reporter.

J. P. SANDERS, M.D.



# LOUISIANA STATE MEDICAL SOCIETY NEWS

## C A L E N D A R

### PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

### RECENT PUBLICATIONS BY DR. LEON J. MENVILLE

The second edition of Polite's book on "Clinical Radiation Therapy" has recently been published. Dr. Leon J. Menville has contributed the chapter on "Radiation Therapy in Diseases and Dysfunction of the Glands of Internal Secretion". A year or so ago, Dr. Menville contributed the chapter on the "Diagnosis of Diseases of the Small Intestine" in Pillmore's two-volume book on "Clinical Radiology" published by the U. S. Navy.

### THE AMERICAN CONGRESS OF PHYSICAL MEDICINE

Will hold its twenty-eighth annual scientific and clinical session August 28, 29, 30, 31 and September 1, 1950 inclusive, at the Hotel Statler, Boston, Massachusetts. Scientific and clinical sessions will be given on the days of August 28, 29, 30, 31 and September 1, 1950. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction seminars will be held August 28, 29, 30 and 31. These seminars will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to therapists, who are registered with the American Registry of Physical Therapy Technicians or the American Occupational Therapy Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

### MEETING OF THE FOURTH DISTRICT MEDICAL SOCIETY

The Fourth District Medical Society met February 7 at the Shreveport Charity Hospital. There were 121 members and guests present.

Guest speaker was Dr. Carl Moyer, Professor of Surgery at Southwestern Medical School, Dallas, Texas, who gave a very interesting talk on fluid and electrolyte therapy.

### PREDICTIONS MADE BY AUTHORITIES OF THE FEDERAL SECURITY AGENCY

Prediction by a group of scientists and health experts that a much larger quantity of ACTH, Cortisone and similar hormonal compounds would be produced this year was made public today by Federal Security Administrator Oscar R. Ewing.

The hormonal drugs, now extremely scarce, were reported last year to offer for the first time definite hope of an effective treatment for arthritis, rheumatic heart disease, certain forms of cancer and mental disease, and for certain other disease conditions.

Coupled with the prediction of greater supplies of the drugs was a strong plea that the total production be used for research purposes. It was emphasized that research involving administering the drugs to humans should be undertaken only under the most rigid medical and scientific controls, since in their present stage of development they may frequently cause undesirable or even dangerous "side effects."

This statement was given after a joint meeting held recently by the five National Advisory Councils which regularly advise the Public Health Service on the problems of general medical research.

### PRACTICAL NURSE EXAMINING BOARD ASKS SUPPORT OF HOSPITALS AND HEALTH AGENCIES

On February 25, 1950 a letter was mailed to all hospitals and health agencies giving information relative to the progress of the Louisiana State Board of Practical Nurse Examiners on licensing practical nurses, and requesting their support in carrying out the requirements of the law.

The letter stated that 3387 practical nurses had been issued licenses during the year 1949; 3207 were licensed by waiver and 180 were licensed by examination. It stated also that 3179 practical nurses had renewed their licenses for the year 1950 and are thus qualified under the law to practice as practical nurses.

Act 509, the law governing the practice of practical nurses, requires that all persons working in this capacity be licensed by the Louisiana State

Board of Practical Nurse Examiners. It requires also that all schools established be accredited by this Board.

One school in the State was qualified for full accreditation, and two have provisional accreditation. Several schools have made known the fact they are ready to apply for accreditation.

It is the desire of the Louisiana State Board of Practical Nurse Examiners to establish such regulations as will assure the public of safe and competent care by licensed practical nurses.

They would like to suggest that when you are considering individuals for employment, you ask to see their credentials and make sure they have renewed their license for the year 1950, and that you give preference to those who have completed the Extension Course whenever possible. Under the law no practical nurse is permitted to practice without a license issued by the La. State Board of Practical Nurse Examiners.

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#### COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION WARNS AGAINST THE INDISCRIMINATE USE OF ANTIHISTAMINIC DRUGS

Reporting on toxic reactions and even death from overdosage, the Council in its current report adds this warning in the use of antihistaminic drugs:

"With over-the-counter sale, careless and habitual use of the antihistaminics may be expected and the medical profession should anticipate similar serious reactions. Basic research is indicated on the chronic toxicity of these agents in human subjects."

The Council reviews the results reported by four groups of investigators. These reports covered 2,357 patients, more than one half being studied by a single observer. Summarizing its analysis, the Council says:

"The diagnostic methods employed have not conclusively demonstrated that the condition treated was actually the common cold. Over half of the cases were investigated in studies with inadequate controls or even without controls, and the interpretations of the results obtained are open to question."

It further says: "None of the studies established

the diagnosis of a common cold beyond reasonable doubt. By exclusion of bacterial infection as a cause, one cannot arbitrarily assume that a virus is the agent responsible for the appearance of symptoms: Allergy may be involved.

"Acceptance of the patient's own diagnosis of a cold introduces many sources of error. The patient may have been mistaken in his belief that he was getting a cold; he may have been manifesting the symptoms of an allergy, or his 'cold' may have been aborted without the aid of any therapeutic agent. By physical examination alone, the cause of coryza [head cold] certainly cannot be established as the virus of the common cold.

"Thus, in none of the studies is there clearcut evidence of a verified diagnosis of the common cold."

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#### BLUE SHIELD MEDICAL PLANS PAST EXPERIMENT

Blue Shield plans, with an enrollment of more than 13,000,000 subscribers for medical care, have passed the experimental stage and can no longer be looked upon as an extra-curricular activity of the medical profession.

So said John F. McCormack, vice president of United Medical Service, Inc., New York, at a recent symposium in New York prepayment health plans which featured the first day of the two-day 10th annual Congress on Industrial Health. The congress, held in the Hotel Roosevelt, was sponsored jointly by the council on Industrial Health of the American Medical Association and the Medical Society of the State of New York.

Mr. McCormack pointed out that Blue Shield contemplates coverage for medical, surgical, obstetric and pediatric conditions at home, in doctors' offices and in hospitals.

"This is a comprehensive undertaking that must be developed carefully to assure permanence and stability without destroying the source of excellent medical care now available to the public," he said.

"Much thought is being given to ways and means to protect Blue Shield subscribers against the paralyzing effects of large medical bills. Everything is done to perpetuate the voluntary and confidential relationship between patient and doctor."

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## BOOK REVIEWS

*A Textbook of Physiology (originally by William H. Howell, By John F. Fulton. 16th ed. Philadelphia, W. B. Saunders Company, 1949. Pp. 1258. Price, \$10.00.*

The chief criticism of the previous edition of this textbook was that there was no discussion of the endocrine glands. This deficiency has now been remedied by an excellent section on the en-

docrine system written by Dr. Jane A. Russell. The entire volume has been extensively revised and there are also a number of new chapters. Drs. Nahum and Chernoff have described the newer work on unipolar electrocardiogram, the interpretation of chest leads and the general interpretation of electrocardiographic principles. There are new chapters on the gastrointestinal tract, on



muscle physiology and cerebrospinal fluid. There is also an excellent chapter on the physiology of micturition. The revision is unusually complete and all of the information has been brought up to date as of the early months of 1949. This edition is to be recommended as one of the best of the available textbooks of physiology. It still contains one of the finest discussions of the nervous system that is available in the usual textbooks. It can be recommended to the students and clinician as an excellent source of much valuable and up-to-date physiological information.

H. S. MAYERSON, Ph. D.

*Care of the Surgical Patient:* By Jacob Fine, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp. 544. Illus.

In the preface to the book the author specifically states this is not a textbook of surgery.

"It is intended to serve the special purpose of providing a ready guide for the over-all care of the surgical patient. It epitomizes the essential facts required for an intelligent understanding of surgical disease and the basic principles involved in their diagnosis and treatment."

The author states:

"The material is presented in much the same manner as one might discuss the subject in an informal lecture or seminar to students or graduates in training."

The author has fulfilled his purpose as set forth in the preface very well.

He has proved by his writing that he is a sympathetic, conscientious surgeon and not merely an operator. His consideration for the emotional status of the patient, both in the preoperative and postoperative period is worthy of emulation by many who should read this volume. While there are points which a reviewer might not agree with, he is bound to state that the material as presented, represents careful, conscientious, observation of patients through long years of practice and the evidence of good judgment and widespread knowledge of the literature together with the ease of manner in which the author has presented his material, makes this volume one which will be of great value to the surgeon, to the resident, and to the busy practitioner, who is in search of ready references on questions involving decisions to be made.

The author has been fortunate in having the close cooperation and collaboration of many individuals, specialists in particular fields.

This work will prove to be a valuable addition to the library of all students of surgery.

ISIDORE COHN, M. D.

*Obstetric Analgesia and Anesthesia; Their Effects Upon Labor and the Child:* By Franklin F. Snyder, M. D. W. B. Saunders Co., 1949. Illus. Pp. 400. Price, \$6.50.

What initiates the infant's first breath of life? Through intricate animal experimentation such as hysterotomy under a saline bath, and adequately controlled tests in the human, it has been definitely established that intrauterine respiratory movements normally occur throughout a large part of fetal life. The respiratory system has been found to be of maximum susceptibility to injury during labor and accidents to this system account for the majority of stillbirths. Since obstetric analgesia presents definite hazards to mother and child, the pitfalls are pointed out in regard to newer drugs and anesthetics. In spite of the growth of knowledge of labor and of its effects upon the child, from the standpoint of mortality, escape from the uterine environment is the most dangerous experience of life—a long and hazardous eight inches of travel.

Section I, entitled "Respiratory Injuries of the Child," includes chapters on the pharmacologic factor in labor, the incidence of respiratory injury before birth, respiration before birth, intrauterine pneumonia, atelectasis, asphyxia and a laboratory method of assay of the effects of various anesthetic agents upon the mother and fetus.

Section II, "The Treatment of Pain During Labor," there are chapters on the following: analgesics and labor pain, morphine, scopolamine, barbiturate, rectal ether, magnesium sulfate and avertin, paraldehyde chloroform, narcotic gases and local anesthetics.

From the research, as well as the practical point of view, this book is filled with information useful to those interested in obstetrics and the newborn. Adherence to the principles outlined, should greatly reduce maternal morbidity and fetal deaths.

EUGENE H. COUNTISS, M. D.

#### PUBLICATIONS RECEIVED

Year Book Publishers, Inc., Chicago: Medical Management of Gastrointestinal Disorders, by Garnett Cheney, M. D.

The Linacre Press, Inc., Washington: Sexual Deviations. A Psychodynamic Approach, by Louis S. London, M. D., and Frank S. Caprio, M. D., with a foreword by Nolan D. C. Lewis, M. D.

Charles C. Thomas, Publisher: Surgical Treatment for Abnormalities of the Heart and Great Vessels, by Robert E. Gross, M. D. (Second Edition).; Menstruation and its Disorders, edited by Earl T. Engle.

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### AMEBIASIS, A CLINICAL EVALUATION\*

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NEW ORLEANS

There is reason to feel that we are threatened with "Amebaphobia." Our newspapers stimulated this fear with an alarming "approximation" of the prevalence of this parasitization locally. Many, failing to concur in this belief, have after adequate surveillance of our own practice come to a point of antagonistic denial of an untruth. This presentation is therefore an evaluation in abstract of clinical amebiasis as it presents itself in our valuation of recent publications, in a review of our own cases and in a comparative evaluation with others locally.

"The habitation of tropical outposts by our military personnel, imprisonment of Axis prisoners captured from these sections in our country, and the eventual return of our forces may produce an unwelcome familiarity with tropical disease throughout the nation."<sup>1</sup> This statement was the premise and essentially the conclusion of our presentation "Statistical Evaluation of Amebiasis," delivered before the American Gastroenterological Association in 1944.

#### INCIDENCE

Amebiasis incidence reports have always

been remarkably variable. In obviously well conducted studies emanating from military sources we encounter figures as high as 31.5 percent in America soldiers in and around Calcutta, India;<sup>2</sup> a modest 11 per cent involvement in soldiers who had been interned by Japs<sup>3</sup> and a low figure of 5.55 per cent in naval personnel.<sup>4</sup>

New York civilian population was granted only a .046 per cent amebic incidence. In Chicago, a study of 4,605 cases revealed a comparative low figure of 0.7 per cent amebiasis.<sup>6</sup> Snorf and his associates<sup>7</sup> proffer the opinion that returning veterans and prisoners of war have not affected the incidence of amebic infection to date in an intensive study showing 2 per cent involvement in asymptomatic patients and 4.3 per cent in symptomatic patients. It is, however, obvious that publications on amebiasis are emanating from areas of our country where previously the disease was unrecognized and in this sense our premise was correct.

One must in reviewing some publications carefully weigh the circumstances surrounding the study. Illustrative is the excellent study by Thomas J. Mackie and his associates in Winston-Salem, North Carolina, showing a 31.6 per cent incidence of *Entamoeba histolytica* in veteran patients. But this was a specialized study at the Tropical Disease Clinic where an average of 5.2 stools were done per patient on individuals referred in with a service-connected disability, many already suspected of and already diagnosed as having amebiasis.

In our own experience, however, we are

\*Presented at meeting of the Orleans Parish Medical Society on December 12, 1949.

From the Browne-McHardy Medical Group. This study was supported in part by a grant from the Medical Research Foundation.



inclined to retract our warning of 1944 for our locality. In the 3,984 ambulatory patients surveyed as of 1943 we reported a 14.1 per cent incidence of amebiasis. In the past twelve months a study under identical circumstances showed a 12.4 per cent involvement in 1,547 case studies. Hospitalization studies in 1943 showed 5.2 per cent amebiasis, 2.08 per cent the second series.

A recent survey at Ochsner Clinic revealed a 9.9 per cent incidence of amebiasis in 1,330 patients carefully checked for parasitization.

At Charity Hospital the department of pathology shows no remarkable variation in incidence to indicate any startling change in the prevalence of amebiasis.

TABLE 1  
INCIDENCE OF AMEBIASIS  
CHARITY HOSPITAL OF LOUISIANA AT  
NEW ORLEANS

Year	No. Studies*	% Amebiasis
1943	4,108	2.6
1944	3,447	4.4
1945	4,262	3.7
1946	4,162	5.6
1947	7,630	3.2
1948	10,105	3.2

\*Data based on number of stools and not on survey of number of patients.

In its entirety this review does not justify the publicity given startling incidence approximations in excess of fifty per cent.

Craig's<sup>8</sup> conservative ten per cent amebiasis approximation for the United States contrasted with Faust's<sup>9</sup> "maybe as high as 20 per cent," coupled with our personal observation, leads us to feel that our incidence figure is quite accurate. In doing so we are certainly not minimizing the importance of frequency of the parasitization with a report of 12.4 per cent amebiasis for our 1949 study.

#### PUBLIC HEALTH PROBLEM

We adhere to the conclusion that parasitization with *Endameba histolytica* is the definition of amebiasis and that as such it is a significant clinical entity. Councilman and LaFleur,<sup>10</sup> in 1891, indicated the error of considering as innocuous those classified as being of the "carrier state." In 1917 Bartlett<sup>11</sup> conclusively demonstrated

the pathology of amebiasis in persons dying of other disease entities and laid the background for the subsequent study. We concur in the judgement of Greenway and Castex<sup>12</sup> that the carrier state is a significant entity. It is no longer pardonable to consider the asymptomatic phase of amebiasis as an innocuous carrier state since extensive lesions in the intestinal tract and elsewhere may exist without producing striking symptoms or positive evidence of their presence. The inference is, therefore, that all patients found parasitized with *Endamoeba histolytica* should be properly treated, regardless of quiescence, until the parasite is permanently eradicated.

The public health problem recognized and studied in detail appears almost unsurmountable. Sanitation and personal hygiene are the most important issues. Detailed stool survey of all food handlers has been considered an impossibility but should be approached logically. Frequent surveys could possibly solve the problem. Unquestionably pre-employment and annual examination would be helpful. In 100 instances of chronic amebic dysentery we encountered 8 restaurant workers, 4 nurses, 2 dentists, 36 housewives, and 2 household domestics. This would indicate a high percentage of potential source of a communicable disease. Entries to this country from endemic areas should and could be required to have an adequate study. In 36 patients who came to us from tropical countries and 64 former military personnel who had either Pacific or North African assignments (to bring the figure to a hundred studies) the incidence of amebiasis was 19 per cent.

Little can be gained by the complete indifference to the public health we at present tolerate.

#### SYMPTOMATOLOGY

Amebiasis shows a symptom complex of highly diverse and changeable character, ranging in degrees of severity from attacks of acute fulminating colitis to all but negligible forms of bowel derangement. It has been conservatively estimated that over 50 per cent of parasitized individuals present

no manifestations specifically interpretable as indicative of amebiasis. The metastatic amebic involvements manifest themselves in relation to the site and extensiveness of the focus. In this respect we must not conclude that amebiasis is the most likely diagnosis in an instance of chronic diarrhea. Appreciative that no small series would be conclusive, that section, seasonal, economic, and age are important considerations, we nevertheless wished to depict the possibilities in our study.

TABLE 2  
DIAGNOSIS IN 100 CASES OF CHRONIC DIARRHEA  
IN WINTER MONTHS

Irritable colon .....	34%
Diverticulosis .....	21%
Amebiasis .....	18%
Chronic ulcerative colitis .....	9%
Gastrogenous diarrhea .....	5%
Malignancy of colon .....	3%
Other enteric parasites .....	3%
Chronic pancreatitis .....	2%
Regional Enteritis .....	2%
Hyperthyroidism .....	1%
Benign colon polyposis .....	1%
Carcinoma of pancreas .....	1%

TABLE 3  
DIAGNOSIS IN 100 CASES OF CHRONIC DIARRHEA  
IN SUMMER MONTHS

Irritable colon .....	19%
Diverticulosis .....	17%
Amebiasis .....	17%
Chronic ulcerative colitis .....	10%
Gastrogenous diarrhea .....	10%
Other enteric parasites .....	8%
Regional enteritis .....	5%
Chronic pancreatitis .....	4%
Malignancy of colon .....	3%
Ileocecal tuberculosis .....	2%
Endometriosis .....	1%
Lymphogranuloma venereum .....	1%

These patients, in a five-year follow-up, indicate no reason to change the initial diagnosis recorded.

Further, in our 1944 statistical survey of 790 cases of amebiasis we encountered 108 patients with amebiasis who had committant enteric disease producing diarrhea.

We must not, therefore, too glibly accept a diagnosis of chronic diarrhea due to amebiasis on presumption or on absolute laboratory demonstration of *Endamoeba histolytica* unless an adequate diagnostic sur-

TABLE 4  
ENTERIC DISEASE CONCOMITANT WITH AMEBIASIS  
IN SERIES

Malignancy of colon .....	6
Benign polyposis .....	2
Proctitis, (non-specific) .....	11
Chronic idiopathic ulcerative colitis.....	4
Gonorrheal proctitis .....	2
Staphylococcal ulcerative colitis.....	1
Diverticulosis of colon .....	6
Chronic cecal volvulus .....	1
Endometriosis (serosal implantation) .....	2
Fistula in ano.....	3
Anal fissure .....	8
Marked anal constriction with recurrent impaction .....	14
Lymphogranuloma venereum .....	1
Bacillary dysentery infection.....	8
Other enteric parasites .....	28
Ileocecal tuberculosis .....	1

vey has eliminated other etiologic possibilities.

Of the last 16 instances of adenocarcinoma of the colon resected under our supervision 11 had been treated for amebiasis for an average period of five months.

Of the last 50 cases of irritable colon surveyed, 38 had been treated for amebiasis for an average period of twenty-six months. Among these were 11 patients who had been on antiamebic therapy for over thirty-six months without symptomatic response with the history of having been re-examined within ten days prior to our examination and told they were still parasitized. In these patients a more than meticulous survey by co-operative study with other laboratories failed to confirm the presence of amebiasis. Further, therapeutic response was prompt to release from amebaphobia and symptomatic measures. Many symptoms have been considered due to amebiasis; unless these respond to eradication of the parasite or be substantiated in a control series, their actual significance is doubtful. Miller<sup>13</sup> made a control study in children with amebiasis which is pertinent in its conclusions.

The inference: be a clinician not an amebiologist; evaluate all patients properly, consider amebiasis a clinical entity when parasitization is present but be cognizant



that it may be merely incidental to the patient's primary disease.

DIAGNOSIS

"No diagnosis of this infection can be said to be accurate unless it is based upon the demonstration of *Endameba histolytica* in the feces, exudates, or tissues of the infected individual." (Craig).<sup>8</sup>

Adequate parasitologic training, facilities, and saline induced fluid defecations (preferably a series of four) properly collected, proctoscopically checked, and immediately examined, facilitate the diagnosis. Zinc sulfate concentration floatation, staining technics, and especially the use of supravital stains, supplementary culturing and substantiating iron hematoxylin staining complete the picture.

At times a presumptive clinical diagnosis preferably aided by roentgen findings is confirmed by therapeutic response or by surgical demonstration of amebic pathology.

While not practical in all instances, Nelson's<sup>14</sup> alcoholic extract medium seems applicable to difficult diagnostic problems and to confirm curative claims.

COMPLICATIONS

It is startling to have patients present the fear of amebic brain and liver abscess imbued in them by a previous physician. It is alarming to read a published statement that amebic hepatitis occurs in more than 50 per cent of the cases of amebic dysentery, and liver abscess is found in from 3 to 5 per cent of these.<sup>15</sup> Spellberg and Zivin<sup>16</sup> with the conclusion that there is an increased incidence of active, virulent amebiasis in World War II veterans report 15 hepatic complications in 58 cases. They encountered an amebic cerebellar abscess. While earlier publications showed a high incidence of hepatic involvement most of these statistics were derived from autopsy studies. An amebic fatality is now a rarity. In 232 cases with amebic dysentery a diagnosis of hepatitis was ventured in 6.4 per cent. Amebic hepatic abscess was proven in 2.1 per cent. In our 790 cases of amebiasis studied in 1944 there were 15 instances of suspected amebic he-

patitis and 5 cases of amebic hepatic abscess. In our 1949 study there were 4 instances suspected of amebic hepatitis and 1 proven amebic hepatic abscess in 193 cases of amebic dysentery.

We are inclined to feel complications are less frequent because of improved diagnostic accuracy and more effective therapeutics.

A summarization of complications encountered is tabulated.

TABLE 5  
43 AMEBIC COMPLICATIONS IN 983 INSTANCES OF AMEBIASIS

Appendicitis (Acute) .....	6
Prostatic abscess .....	1
Hepatitis .....	19
Hepatic abscess .....	6
Perforation of colon .....	1
Granuloma of colon .....	6
Subphrenic abscess .....	2
Pleural effusion .....	1
Massive hemorrhage from amebic ulcerative colitis* .....	1

\*Only fatality in series.

TREATMENT

A therapeutic program should persist until the *Endameba histolytica* are permanently eradicated; by this we infer a twelve month posttherapeutic follow-up with negative stool surveys at three month intervals. There are now available therapeutic agents which when properly employed can accomplish this.

To be effective an amebacidal agent must be absorbable; the known trophozoite penetration coupled with metastatic potentialities negates therapeutic claims for preparations sponsored for their surface and measured penetration efficiency. There must also be a correlation of drug localization with activity in selecting an amebacidal agent. Emetine, chloroquine and the thioarsenites are considered the more efficient for extraintestinal amebiasis. The iodohydroxyquinolines and pentavalent arsonic acids while effective in intestinal infections are probably not absorbed sufficiently and are excreted too rapidly to accumulate and be of curative value in extraintestinal involvement. A dearth of rational thought exists in reports on value of an

agent against cysts as compared to that upon the trophozoite yet reports of such study continue to appear in the literature.<sup>17</sup>

Emetine, experimentally proved to concentrate in the liver, is thereby efficient in hepatic involvement.<sup>18</sup> Indicated in the control of severe amebic enteritis and of extraintestinal amebiasis its efficiency thereon compensates for its high toxicity<sup>19</sup> and its "curative" potentiality estimated to be less than 30 per cent. We conservatively advocate limiting emetine hydrochloride to a daily 1 grain subcutaneous dose for eight days. We know of unusual instances where it has been given in such daily dose for three hundred and sixty-five days without apparent toxicity and of other instances of severe reaction after only a few days of therapy.

We feel E.B.I. and other oral preparations of emetine are not worthy of consideration.

Chloroquine parallels the tissue distribution of emetine<sup>18, 20, 21</sup> in intestinal penetration, liver, and other organ concentration. With insignificant toxicity it apparently equals emetine's efficiency in intestinal involvement. The only toxic manifestations we have encountered have been vertigo, tinnitus, and ataxia concurrent in 4 patients, which cleared rapidly on withdrawal of the drug and permitted restarting the medication in seventy-two hours. Headaches, visual disturbance, pruritis and gastrointestinal complaints have been reported.<sup>21-24</sup>

Proportionally superior hepatic localization,<sup>25</sup> greater amebicidal efficiency and less toxicity<sup>26</sup> of the thioarsenites over the pentavalent arsonic acids led to their clinical trial and conclusion of therapeutic efficiency in amebic hepatitis.<sup>27</sup> We would like to indicate that since arsenic is itself a hepatotoxic agent its use in amebic hepatic involvement may be contraindicated. We do not use any arsenical amebicidal agent when demonstrable hepatic disease exists.

Each of these three preparations advocated for use in extraintestinal amebiasis is acknowledged ineffective in intestinal parasitization. Therefore adjunctive ame-

bicidal agents are necessary for the complete management of amebiasis.

Diodoquin, chinofon (yatren, anayodin), vioform and carbarsone are accepted therapeutically efficient for intestinal amebiasis. Their curative efficacy is reported to vary from 70 to 90 per cent for intestinal infections. The use of these agents alternately and in a wide variety of combinations probably compensates for the deficiencies of each and enhances the curative potentiality of the group.

A study of chiniofon metabolism<sup>28</sup> shows its absorption though rapid to approximate only 12.9 per cent and thereby indicates its limitation to intestinal amebiasis. This study is applicable to all of the iodohydroxyquinolines and to the pentavalent arsonic acids. Specific dosage is established. We do not favor the use of enemata prepared from this group feeling oral administration is satisfactory.

It is appreciated that herewith we have not covered all of the arsenical and iodohydroxyquinolines and their combinations that have been tried.

Bismuth glycolylarsanilate (Milibis, Wia., Win. 1011) is a more recently introduced apparently effective combination of 15 per cent arsenic and 42 per cent bismuth. Experimentally of minimal toxicity and maximal intestinal concentration explained by its insolubility it gives a wider margin of safety than other arsenicals with a greater intestinal efficiency.<sup>29, 30</sup> The advocated dosage is 0.50 gm. three times a day for seven days. As yet there have been no reported instances of arsenic sensitivity. We, however, have observed a single instance of arsenical encephalitis following excessive dosage in a patient suspected of being an alcoholic. (Berberian<sup>31</sup> in questioning this complication questioned its occurrence in a person not imbibing alcohol at the time). We have also observed an instance of typical mild exfoliate dermatitis occurring concomitant with the administration of milibis which cleared in sixteen days to recur when milibis was restarted. This second patient had not used alcohol.



The preparation apparently deserves continued trial. Winthrop-Stearns report a study of 461 patients with 82.6 per cent "cured."

During the past few years there have been many therapeutic agents advocated with a concept of amebacidal specificity but which appear, like the sulfonamides and vaccines, to be merely adjunctive. To this end many of the pharmaceutical laboratories have under trial combinations of antibiotics and amebacides.

Para-aminobenzoic acid gave symptomatic response.<sup>32</sup> Bacitracin has been granted a durative percentage.<sup>33</sup> Subtilin by surface tension lowering action is reported to rupture the amebic cell wall.<sup>34</sup> Aureomycin<sup>35</sup> has been a successful agent in 3 cases. The claims for penicillin and streptomycin have been conservative;<sup>36</sup> there is one report of prolongation of viability of ameba cultures by streptomycin.<sup>37</sup> The use of vaccines on the presumption of concomitant bacterial infection with Shigellosis and brucellosis<sup>38</sup> is mentioned.

At present we have under trial a less thoroughly absorbed chloroquine (aralen naphthoate) which may be more efficient for intestinal parasitization while adequate for extraintestinal involvement.

We are not concerned in this presentation with the surgical management of the complications. It is probable that with more adequate stool study, amebic consciousness and accurate application of proper amebacidal therapy together with further advances in chemotherapy the need for surgery may become rare indeed.

#### CONCLUSIONS

1. Subsequent surveys have failed to confirm our apprehension that amebiasis and other tropical diseases would become a pressing problem in the United States following World War II.

2. Publications and surveys have served to increase the alertness of the clinician, and reports and studies have become more widespread.

3. There is a definite Public Health problem which should be approached rationally, but the facts do not justify serious

apprehension and the profession should guard against the development of "Amebaphobia."

4. Complications constitute only a small percentage. Possibilities and alertness in their management should be stressed, but certainly the exception not made the rule for approach to the problem of amebiasis.

5. Present therapy when properly applied shows a high degree of efficiency, and notable advances have been made in the management of extraintestinal infections.

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## HEART COMPLICATIONS IN BACILLARY DYSENTERY

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AND

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NEW ORLEANS

As early as 1930 one of us (D.N.S.) was the first to recognize the damage to the myocardium and the reaction of the sinus node mechanism to the presence of *B. dysenteriae*. In 1935, these findings were further corroborated by Silverman and Efron,<sup>1</sup> who were able to determine the allergic nature of these phenomena, as being due to hypersensitivity to the infection in some cases, while in others the same reaction followed the injection of small doses of concentrated autogenous vaccine. These changes showed all three types of sensitivity, local, focal and systemic, there being in all anaphylactic skin reactions at the point of injection; while in some there were vasomotor disturbances, arthritis, and even intestinal bleeding, due to vascular allergy. It is with these allergic phenomena and the toxic infectious lesions of the heart muscle that we are primarily concerned and are describing later in this paper.

The hearts of dysentery patients do not present any special symptoms. There is no cyanosis, and other symptoms of cardiac insufficiency are likewise absent.<sup>2</sup> The findings of Schittenhelm<sup>2</sup> are confirmed by those of Habs.<sup>2</sup> Gertenberg<sup>2</sup> (quoted by Habs), also states that enlargement of the heart and visceral congestion are not encountered. Late cardiac sequelae are very exceptional. No important lesions of the heart are observed in connection with the dysenteriae rheumatism in accordance with the observation that gravely ill patients who recover from circulatory insufficiency hardly ever present symptoms of heart lesions at a later date. It also seems that the heart suffers very little damage in dysentery, considering the seriousness of the disease. Uhlenbrach, (quoted by Habs),<sup>3</sup> states that he saw a considerable number of cases of myocarditis in the last year.

NOTE: Since the presentation of this paper we have a twelve week follow-up on 25 patients treated with aralen naphthoate. All 25 patients are entirely asymptomatic and a series of stool surveys have proved adequately the eradication of amebiasis. We do feel that this is an inadequate period of posttherapeutic follow-up and will continue this study. At the present moment, however, we are favorably impressed with the use of this drug as an amebocidal agent, in intestinal amebiasis.

\*Presented at meeting of the Orleans Parish Medical Society, October 10, 1949.



According to Michel,<sup>2</sup> (quoted by Habs), the dysenteric heart presents three types of muscle change: first, simple degenerative processes of the muscle, toxic cases that end quickly; second, interstitial myocarditis, such as may occur in the infectious disease; and, finally, only in a certain group of cases first observed in rheumatism and later observed in dysentery by Silverman.<sup>1</sup> The latter's cases had their origin in allergic reaction. Then others encountered tuberculosis, dysentery, scarlet fever, and similar diseases, viz., swelling of connective tissue near the vessels and Aschoff's granulomata. These hearts presented no symptoms when examined by auscultation, percussion, and x-rays.

Of 25 cases presented by Habs,<sup>2</sup> 15 showed sinus bradycardia, with only 1 having pathological changes in the electrocardiogram. In our series of 3 cases, none presented bradycardia, but all 3 had sinus tachycardia. There were pathological changes confirmed by electrocardiographic findings in 2 of 3 cases. In all of Habs's cases<sup>2</sup> the tachycardia and bradycardia were observed in the first week of the disease. We cannot definitely ascertain the date of onset of the lesions in our cases as in 2 of the 3, the lesions were present when the patients were first examined. In these cases the symptoms had been present for several days. In the third, there was a history of heart symptoms intermittently over an eight year period.

In the series of cases presented by Habs the pathogenesis of the changes in the electrocardiogram cannot be differentiated in a detailed manner. But our continuous observation does not admit of any doubt that the changes are caused by toxic infectious lesions of the heart muscle. We believe that according to the pathological research of Krauspe, the rare cases of quickly dying, toxic dysentery patients sometimes show degenerative processes in the heart, while at other times the cause is hyperergic inflammation in the sense of Kringe. But in most cases the changes are probably caused by interstitial myocarditis. It is, however, not possible clinically to distinguish the in-

flammatory changes from the degenerative ones.

The high percentage of pathological changes in the electrocardiogram leads to revision of the prevailing theory on the heart of the dysentery patient. Toxic infectious lesions of the heart muscle, mostly of a temporary nature, are by no means so exceptional as generally believed until now.

Herewith are presented 3 cases of chronic bacillary dysentery illustrating the toxic infectious lesions described by Habs,<sup>2</sup> and Michel.<sup>2</sup> 1 case in which permanent myocardial damage is present and the other 2 myocarditis of a temporary damage. It is our belief that the first named is one of interstitial myocarditis which is now evident even though the intestinal contents are free of *B. dysenteriae*. The other 2 show reversion back to normal of the electrocardiographs and other cardiac findings.

#### CASE REPORTS

Case No. 1. Mrs. L. E. T., admitted to Southern Baptist Hospital on March 9, 1949, after giving a history of loose bowels and mucus for six weeks. The loose bowels were associated with cramping. Although previous injections of emetine, and sulfadiazine by mouth had been administered, the diarrhea persisted and patient became progressively weaker. Stool cultures made on March 15, 1949, showed the Duval-Sonné strain of *B. dysenteriae*. The patient's serum gave positive homologous agglutinations in dilutions up to 1:640. At the time of admission, severe cardiac embarrassment, as manifested by sinus tachycardia, rate 120-160, dyspnea, and gallop rhythm, was present. A few days later a precordial friction rub and a protodiastolic murmur appeared. An electrocardiogram made at this time revealed depression of the S-T segments in all leads except lead III.

Cultures made on March 16, 24, and June 6, 1949, showed no evidence of Duval-Sonné strain of *B. dysenteriae*. An electrocardiogram made on June 4, 1949, revealed a normal rate and sinus rhythm with some reversion of the S-T segments towards normal but suggestive evidence of myocardial damage. There are periods at present when the rate will become rapid but no evidence is present on auscultation of the murmur described above, the gallop rhythm, or the pericardial friction rub.

Case No. 2. Dr. H. W. B., admitted to Southern Baptist Hospital, March 7, 1948, with chief complaint of diarrhea and fibrillation. History was that weeks previously he had fibrillation, took digitoxin; with fibrillation, he had apprehension

but no pain. Fibrillation would last a few minutes, then would be followed by tachycardia, a rate of from 140-160 for several hours. Upon further questioning it was revealed that this patient had dysentery while in the Service, in November 1944. An electrocardiogram made then had shown evidence of auricular fibrillation. He had episodes of diarrhea with cramps whenever he had this arrhythmia. Cultures made on March 8 and 10, 1948, were positive for the Duval-Sonné strain of *B. dysenteriae*. Although the electrocardiogram made on March 8, 1948, did not show auricular fibrillation there was suggestive evidence of myocardial damage as evidenced by a Q3, T3 pattern.

He was started on the specific vaccine of Duval-Sonné beginning with dilutions of 1:100,000. Seven months later an electrocardiogram was made and the findings were normal; the arrhythmia previously reported had disappeared. Cultures were negative.

Case No. 3. Mrs. P. L. T., a white female, 47 years of age, gave a history that she had been treated by another physician during a period of eight years for intestinal autointoxication associated with paroxysmal tachycardia at infrequent intervals. For periods of several months she would be completely well then would develop diarrhea, fever, and pain in the upper left abdomen with a feeling of extreme weakness, and palpitation. At such times, the doctor usually found a very rapid heart rate ranging from 160-180. As soon as the fever disappeared, the heart rate dropped to normal. On one occasion, July 1921, at the beginning of these attacks, patient was hospitalized for over a month, and treated by colonic flushes, laxatives, and smooth diet with a minimum of roughage.

This patient was referred to one of us (D.N.S.) August 5, 1929, because of the recurrence of diarrhea and cardiac embarrassment for eight years. The history revealed that she had had an intestinal disturbance for two weeks. At the onset there was an acute episode of loose bowels. There had been similar attacks over a period of many years. During these many years her heart had given her much trouble, necessitating complete rest from time to time. Examination revealed a well nourished well developed, white female who showed certain abnormal findings. There were palpable posterior cervical glands and an enlarged palpable liver. The cecum apparently was full, and the sigmoid was palpable. A proctoscopic examination on August 5, 1929, revealed several deep ulcers in the rectum about 5 inches above the anus. There were several other superficial scattered ulcers. Agglutination tests with the patient's serum, made on August 12, 1929, showed strongly positive reactions with the Flexner strain of *B. dysenteriae*.

Desensitization, or so-called neutralization therapy, with dilution of autogenous vaccine was instituted with disappearance of the lesions in the rectum by February 2, 1930, and a disappearance

of cardiac symptoms right after treatment was started September 1929. Heart rate returned to normal permanently and there was no recurrence of paroxysmal tachycardia after that.

#### DISCUSSION

Felsen<sup>3</sup> merely mentions the possibility of cardiac disturbance in acute bacillary dysentery; he makes no mention of its occurrence in the chronic disease, nor does he cite any concrete evidence of this combination.

Three cases of chronic bacillary dysentery in which the infecting organism,—two different strains of the dysentery bacillus,—has been instrumental in producing cardiac irregularities are herein reported. In view of the previously reported work of Silverman and Efron,<sup>1</sup> describing the many allergic manifestations of *B. dysenteriae* infection, principally including these of a vasomotor imbalance which could be precipitated by the administration of *B. dysenteriae* vaccine, it is thought the heart disturbances likewise brought out in this paper represent one of these allergic reactions. Then again the studies of the authors have shown a complete disappearance of cardiac symptoms following the eradication of the dysentery bacilli from the intestine of these patients. While this was true in all 3 patients, 2 showed complete reversion of electrocardiographic findings to normal.

#### SUMMARY AND CONCLUSIONS

1. To our knowledge, the first instances of heart complications incident to chronic bacillary dysentery encountered and studied in America are reported in this communication.

2. The authors feel that attention to the heart should be a routine study in *B. dysenteriae* infections.

3. All cases of chronic bacillary dysentery should have skin tests to determine the sensitivity of the patient to the infecting organism, since the avoidance of undue allergic reactions is predicated upon the concentration and dose of the vaccine.

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## CONGENITAL FAMILIAL HEMOLYTIC JAUNDICE\*

ISIDORE COHN, M. D.†

NEW ORLEANS

This presentation will be limited to a discussion of experiences with the congenital type of hemolytic jaundice.

It is essential for one who undertakes to do a splenectomy for hemolytic jaundice to bear in mind the necessity for accurate diagnosis in order to avoid the pitfalls which might arise from operating upon some of the acquired cases of hemolytic jaundice. It is true that some types of acquired hemolytic jaundice do respond well to splenectomy, but it is also important to remember that the familial type gives the best and most lasting results following splenectomy.

It is essential that there be close cooperation with internists, and hematologists, when one undertakes to establish a diagnosis and the indications for splenectomy in a case of hemolytic jaundice.

Hemolytic jaundice of the congenital type has been observed in this group, from the first to the fourth decade of life. Jaundice of varying severity, secondary anemia, and splenomegaly, are at times the only clinical manifestations. The laboratory furnishes the essential diagnostic characteristics of the disease. The characteristic red cells found in smears of hemolytic jaundice are spherocytes of the microcytic type. This abnormal form of red cell may constitute anywhere from 10 to 25 per cent of the total number of red cells. There is usually an increase in reticulocytes and an increase in the fragility of the red cells.

There are several questions which arise when one contemplates splenectomy for congenital hemolytic jaundice:

1. Why should one expect splenectomy to effect a cure?

2. What is the role of the spleen in the active phase of the disease?

3. Are spherocytes formed in the hyperactive bone marrow, or are they formed after leaving the bone marrow?

4. After splenectomy, even though spherocytes persist in the peripheral circulation, why is it that the hemolytic process does not recur?

These and many other questions have been investigated within recent years, and like many other questions associated with the functions and dysfunctions of the spleen, remain controversial.

It is accepted that the microcytic spherocyte is the characteristic cell found in hemolytic jaundice of the congenital type. Various theories have been postulated with reference to the origin of this cell which carries a stigma of increased fragility.

Naegeli, Haden, Fowler, and others consider spherocytes to be the result of specific bone marrow defects. Dameshek and his associates found that the immature red cells in bone marrow are of normal size, although the mature red cells in the blood stream are microcytic. They conclude that the abnormal cells are not formed in marrow but are the result of the action of some agent which has already reached the general circulation. They believe that spherocytes are formed outside of bone marrow from mature red cells by the action of various hemolytic agents. The exact site of the formation of hemolysin is not definitely known.

Dameshek in his latest contribution states that "The role of the spleen in normal and increased hemolysis is still obscure. The spleen is certainly an aid in most hemolytic processes and at times initiates and carries through the entire reaction."

He does not believe that a single mechanism can be considered responsible for all hemolytic states. As a result of his experimental work he believes: "That the vital activities of certain cells, notably those in the spleen, facilitate hemolysis."

It is concluded that a hypersplenism ex-

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ists and in these cases splenic activities may be responsible for increased hemolysis and the removal of the spleen results in a cessation of the hemolytic process.

The incrimination of splenic activity is accepted by most authorities.

Ham and Castle introduced a rather interesting hypothesis. They believe that an erythrosthiasis within the spleen is responsible for increased hemolysis. This idea is rejected by Dameshek and his associates.

Whether we accept the idea that increased destruction of red cells in the spleen is due to erythrosthiasis or to hypersplenism, it remains a fact that removal of the spleen does effect a remarkable clinical cure. The continued presence of spherocytes indicates that there is a congenital defect which is responsible for the presence of spherocytes of the microcytic type in circulating blood.

Enough has been said to be able to answer the questions which were proposed in the earlier part of the paper.

On theoretical and experimental grounds, one should expect splenectomy to effect a cure, because the spleen as a result of hypersplenism provides a more active hemolytic action on the already susceptible spherocyte. While it is true that the spleen may not be the entire factor, it does represent the major portion of the reticuloendothelial system responsible for destruction of spherocytes and the liberation of increased amounts of serum bilirubin, more than can be ordinarily removed from the liver.

Even though spherocytes persist after splenectomy the absence of exaggerated action of the spleen in the destructive process allows the patient to go on without marked evidence of increased hemolysis.

The diagnosis of congenital familial hemolytic jaundice rests on:

1. A familial history (not always obtainable).

2. The presence of jaundice, which may or may not be associated with abdominal pain, but which is not associated with the manifestations found in obstructive jaundice.

3. The presence of spherocytes in large

numbers, increased reticulocytes, increased fragility of the red cells, increased serum bilirubin, and the finding of urobilin in the urine.

#### 4. Splenomegaly.

This report is primarily based on personal experiences with a single family, five members of which I have operated upon at Touro Infirmary. The five cases represent two generations. In the first generation, there were two sisters and one brother. The second generation is represented by two daughters of the brother. The age of the patients varied from two years to thirty-four.

#### CASE REPORTS

Case No. 1. Mrs. H., age 28, first admitted to the Medical Service of Touro Infirmary, October 29, 1941. The patient stated that her father, one brother, and a sister suffered with the same condition.

The chief complaint was jaundice, weakness, and numbness of the extremities. She stated that she had had repeated attacks of jaundice, with spontaneous remissions for many years. She had been told that she had an enlarged spleen at the age of nine, and that the doctor had advised splenectomy at that time.

The salient features of the examination were: Jaundice, and a palpably enlarged spleen and liver.

The essential laboratory data follow: Red count 4,750,000; hemoglobin 64 per cent. There was increased fragility. Hemolysis began at 46 and ended at 25. The control hemolysis began at 40 and ended at 46. The reticulocyte count was 11 per cent. The icteric index was 50. The urine showed a two plus urobilinogen. The pathologist did not report the presence of spherocytes.

On November 17, 1941, a splenectomy was done. An enlarged spleen weighing 675 gms. was removed. Two accessory spleens, approximately 3 cms. in diameter were also removed. The pathologist reported that the accessory spleens presented an identical picture with the primary spleen: "The histological picture is consistent with the clinical diagnosis, congenital hemolytic jaundice."

Recovery was uneventful. The patient has since been kept under observation for follow-up.

Six months after operation the patient had gained 18 pounds. The skin was not found to be jaundiced. At that time no spherocytes could be seen in the wet preparation.

In 1945, four years after the operation, the blood picture showed: Spherocytes 12 per cent; Reticulocytes .09 per cent; Icteric Index 5. There was an increased fragility of the red cells, identical with the preoperative findings.



Five years after the operation the patient complained of sharp, stabbing, epigastric pain, the onset of which was usually one to two hours after meals.

Gall bladder visualization was reported as suggestive of cholecystitis.

In July 1947, five and one-half years after the original splenectomy, a cholecystectomy was done. Numerous small calculi were found in the gall bladder. At this time many spherocytes were seen in the wet preparation. The last follow-up blood study was made in June 1949, at which time the report stated: Hemolysis is slightly increased. Icteric index 4, Reticulocytes .05 per cent. No report was made on the presence or absence of spherocytes.

This patient's general condition is excellent and she has had no further jaundice.

Case No. 2. Mrs. E. B., age 34, admitted to Touro, November 15, 1943. The patient stated that she had jaundice in childhood with episodes of increased intensity and regression. Her chief complaints were substernal pain, nausea and vomiting, and dizziness for the past month.

Examination revealed slight icteric tinge of the sclera and skin, and a palpably enlarged spleen. The liver was not palpably enlarged. The blood picture prior to operation follows: Red count, 3,290,000. Hemoglobin, 70 per cent. There was increased fragility. Hemolysis began at 50 and ended at 34. The control began at 42 and ended at 24. The pathologist did not report on the presence or absence of spherocytes.

Splenectomy was done November 24, 1943. The spleen weighed 526.8 grams, and measured 17 by 12½ by 5 cm.

The pathologist reported "Splenomegaly histologically compatible with congenital hemolytic icterus."

In 1945, two years after the operation, the patient was found to be in good health, there was no evidence of jaundice. At that time the icteric index was 7. Reticulocyte count was 1.6 and spherocytes reported 20 per cent. There was an increased fragility. Hemolysis began at 50 and ended at 36. In the control it began at 44 and ended at 30.

The patient was last seen in August 1947, at which time no jaundice was found. Her general health was excellent.

She has refused to come in for further laboratory studies.

Case No. 3. J. A. B., age 3 first seen November 20, 1943. The mother stated that the child had had an enlarged spleen for a long time, and that she had had repeated attacks of abdominal cramps and jaundice. Three days prior to coming under observation the child had had an episode of abdominal cramps and jaundice.

On admission to Touro, the child was jaundiced; there was marked tenderness in the left upper

quadrant, and a large spleen could easily be palpated, as far down as two fingers above the crest of the ilium. The liver was not palpably enlarged.

The peripheral blood study at that time showed a reticulocyte count of 3.7 per cent. Spherocytes .5 per cent. Red cell count 3,080,000. There was an increased fragility. Hemolysis began at 50 and complete at 32. The icteric index was 40.

A splenectomy was done on November 26, 1943. A large spleen measuring 15 by 7 by 3½ cms. was removed.

Repeated follow-up blood studies, have always shown a persistence of the spherocytes varying from the report of "Slight spherocytosis to 7 per cent." All of the follow-up studies also indicated persistence of an increased fragility of the red cells.

Since operation the child's health has been excellent and she has had no recurrence of jaundice.

Case No. 4. E. B., Jr., age 27. Admitted to Touro, October 10, 1944.

Chief complaint was repeated episodes of jaundice, nausea, and vomiting.

He stated that several generations back in his family have been affected with the same symptoms.

The peripheral blood study prior to admission to the hospital showed spherocytes 10 per cent. Increased fragility. Hemolysis began at 48 and was complete at 30. The control began at 40 and complete at 32. The red count was 4,500,000. Hemoglobin 89 per cent.

Abdominal examination revealed a large spleen which occupied the entire left upper and lower quadrants.

Icteric index was 15.

A splenectomy was performed on October 25, 1944.

Repeated blood studies since operation have shown a persistence of spherocytes, varying from "A few spherocytes present to 8 per cent". The icteric index has varied between 5 and 6 per cent. The reticulocytes have varied from .02 per cent to .08 per cent.

At the last examination, in 1949, the serum bilirubin was .05 mgms., and the cephalin flocculation was negative.

This patient has remained well; he has had no further jaundice, weakness, or any other complaint.

Case No. 5. J. A. B., age 3, daughter of Case No. 4, E. B. This child was first seen when she was six week of age. She was observed because her father, one sister, and two aunts, had been operated upon for congenital familial hemolytic jaundice.

I was unable to feel an enlarged spleen at this time. There was no discoloration of the sclera.

A complete blood study was requested—this advice was not followed.

Eleven months later, examination was made and a reticulocyte count of 8 per cent was found. Three

per cent of the red cells resembled spherocytes. Red cell count was 3,600,000. Hemoglobin 60 per cent. There was an increased fragility.

At that time the spleen was palpably enlarged.

In April 1946, an enlarged spleen and liver were found and peripheral blood study and hospitalization were advised with a view to splenectomy being done. The parents had the child admitted but refused operation.

In June 1947, the child was again seen because of jaundice, diarrhea, and temperature as high as 104° F.

Reticulocyte count at that time was 19.6. Total red count was 2,930,000. Hemoglobin 57.5 per cent. An increased fragility was found.

The pathologist reported that he was unable to find evidence of spherocytosis.

On June 8, 1947, a splenectomy was done, and the pathologist reported: "Histologically compatible with congenital hemolytic anemia."

In May 1949, peripheral blood study showed a reticulocyte count of 4 per cent. Slight spherocytosis. Persistent increased fragility. Total red count 4,650,000. Hemoglobin 84 per cent. Cephalin flocculation was negative. Icteric index was 4.

The child's condition at the present time is excellent.

#### CONCLUSIONS

During the period of time considered in this report 6 other proven cases of congenital hemolytic jaundice have been found in the records of Touro Infirmary by Dr. Leon, the Resident in Surgery. Recovery has followed in all of the cases.

At a later period we expect to give a report on statistics from Touro and Charity Hospital.

1. It is important to differentiate acquired from congenital familial hemolytic jaundice.

2. The results following splenectomy in the congenital type are much more satisfactory than reported results from operations in the acquired hemolytic types of jaundice.

3. Following splenectomy the characteristic blood findings (microcytic spherocytes) persist in the peripheral blood.

4. There is a persistence of increased fragility of red cells.

5. A brief discussion has been given of the various theories of the origin of spherocytes, and the cause of increased fragility of the red cells.

6. Five cases occurring in one family

successfully operated on have been included in this report.

NOTE: I wish to thank Dr. Hertzog and Dr. Nadler of the Departments of Pathology and Biochemistry (of Touro Infirmary) for their cooperation in connection with the study of the blood and blood chemistry; I also wish to thank Dr. Leon, Resident in Surgery at Touro Infirmary for his cooperation.

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## TRACHEOESOPHAGEAL FISTULA

WITH REPORT OF A CASE TREATED SUCCESSFULLY BY LIGATION AND END-TO-END ANASTOMOSIS\*

H. REICHARD KAHLE, M. D.\*\*

NEW ORLEANS

Tracheoesophageal fistula is a condition in which the outlook for survival has been completely reversed by recent advances in intrathoracic surgery. Although it was first described by Durston in 1670 and by Gibson in 1703, Plass, in 1919, was able to collect from the literature only 136 verified cases and up to 1939 no instance of survival was on record.<sup>1, 2</sup> In that year, working independently but using the same general plan of attack, Leven<sup>3</sup> and Ladd<sup>4</sup> each successfully ligated a fistula and formed an anterior thoracic esophagus.

This was an enormous advance, but it was not the solution of the problem. Lanman,<sup>5</sup> in 1936, was the first to employ end-to-end suture, which had been mentioned by Holmes,<sup>6</sup> in 1869, in an extremely pessimistic report, as a possible mode of treatment. Lanman's attempt did not succeed, but he was undeterred by his failure and in 1940, when he reported 30 deaths in 30 surgical cases at the Boston Children's Hospital, 4

\*Presented at meeting of the Orleans Parish Medical Society, December 12, 1949.

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treated by direct anastomosis, he still insisted that end-to-end suture was the procedure of choice and that it would eventually be performed successfully. It was only a year later that Haight<sup>2</sup> fulfilled his prophecy and thus ushered in an era in which the surgical mortality of this formerly hopeless congenital anomaly has steadily improved. Bigger's<sup>1</sup> experience is indicative of what has been accomplished: Between 1941 and 1948, he performed 11 operations for tracheoesophageal fistula, 4 of them direct anastomoses, with 1 survival. In 1949, he reported 7 additional operations, 5 of them direct anastomoses, with survival in all 7 cases.

Our local results, unfortunately, do not yet begin to approach Bigger's brilliant record, or the similarly excellent records of such surgeons as Haight<sup>7, 8</sup> and Ladd and Swenson.<sup>6</sup> In the 26 cases recorded at Touro Infirmary and Charity Hospital of Louisiana at New Orleans between 1935 and December 1, 1949, there were only 2 survivals, both of them in cases treated by anastomosis. One of the survivals occurred in the 3 cases which I have personally operated on\* and the other in a case operated on by Dr. Craig Herringman. I should hesitate to bring to the attention of this Society so poor a record if it were not for the more optimistic outlook now available to these unfortunate children when the anomaly is promptly recognized and when the fundamental surgical principle of closure of the fistula is promptly applied.

#### INCIDENCE

The reported cases of tracheoesophageal fistula give no hint of its true incidence: As long as it was regarded as beyond cure, it was chiefly ignored. The distribution of the 26 cases observed at the two New Orleans hospitals makes that quite clear. Only 1 case was recorded in 1935 and only 1 in 1940. Only 7 others were recorded up to 1944. But in the last five years of the fif-

teen year period surveyed, 17 cases were recorded. Gray-Turner regards the incidence as about that of harelip and cleft palate,<sup>6</sup> and Haight,<sup>2</sup> who also emphasizes that only recent figures are of value, reports an incidence of 1:2,196 newborn infants. At the Boston Children's Hospital, the figures for which are naturally highly selective, there were 82 cases in an eight year period.

Fifteen of the 26 New Orleans cases were treated at Charity Hospital, 4 of them in negro children, and 11 were treated at Touro Infirmary. This is probably a fair index of the racial incidence since Charity Hospital, except for a small negro institution, is the only hospital in the city which admits negro patients. Sixteen of the 26 children were male and 10 were female.

#### EMBRYOLOGY AND PATHOLOGY

The basic cause of tracheoesophageal fistula remains to be clarified, but the malformation itself is easy to understand. The respiratory anlage, it will be recalled, develops from the foregut in a very early embryologic stage, the trachea and esophagus at this time being a single tube. The imperfection apparently has its inception between the fourth and twelfth weeks of fetal life, when, because of some error in the growth of mesoderm which normally separates the lung bud from the esophagus in the 4 mm. stage, the communication between the two structures persists. The esophageal atresia is also easy to understand. At this same time in embryologic development the esophagus normally becomes occluded by a proliferation of the epithelial lining, the lumen being later re-established by vacuolization. If vacuolization does not occur, atresia persists.

Of the several classifications of tracheoesophageal fistula which have been advanced, the most important are by Vogt<sup>9</sup> and Ladd,<sup>1</sup> Ladd's being the simpler and more logical. In type I defects the upper portion of the esophagus ends in a blind pouch in the region of the first or second dorsal vertebra and the lower segment begins as a similar blind pouch at the level of the fourth or fifth dorsal vertebra. In type

\*Another of these patients, although premature and weighing only 3 pounds, lived for four days after operation and probably would have survived except for a technical error in the institution of drainage.

II defects the lower anomaly is the same as in type I but the upper segment ends in a fistulous tract which enters the trachea just above the bifurcation. In type III defects, which are by far the most common, the upper segment ends blindly, as in type I, and the lower is connected with the trachea, just above the bifurcation, by a fistulous tract. In type IV defects the fistulous tract of the lower segment enters the trachea at the carina, instead of just above the bifurcation. Otherwise the malformation is of the type III variety. In type V defects both upper and lower segments communicate with the trachea.

In the 26 cases observed at Touro Infirmary and Charity Hospital 15 defects were of the classical type III variety and 8 additional cases were variants of this type. In 5 of the 8 cases the communication was at the bifurcation or the carina, as in Ladd's type IV, and in 3 other cases the communication was with the bronchus instead of with the trachea. In 1 of the 3 remaining cases the esophagus was atretic and there was no fistula, this being an extremely uncommon malformation; 1 case was of the type V variety, with both upper and lower segments communicating with the trachea, and in 1 case the description does not make clear whether the anomaly was type III or type V. There was no instance in the series of Ladd's type II, in which only the upper esophageal segment communicates with the trachea.

#### DIAGNOSIS

The diagnosis of tracheoesophageal fistula, and of the type of the defect, is not difficult if only the possibility is kept in mind. An infant who presents excessive saliva or frothy mucus, who has choking spells in which he becomes cyanotic, and who regurgitates his feedings and water should immediately arouse suspicion and a catheter (#10 F.) should at once be passed into the esophagus to determine its patency. Gage,<sup>10</sup> in fact, suggests that this procedure be carried out on every newborn child. If the plan were universally adopted, repeated efforts to feed the child would not be made, and the aspiration pneumoxia, which

so frequently follows them and which adds so much to the mortality, would not occur.

If atresia is present, obstruction to the passage of the catheter will be encountered 10 or 12 cm. from the gum margins. The next step is a plain roentgenogram. If it is inconclusive, or if more exact information is desired, a small amount of lipiodol can be instilled through the catheter to outline the upper esophageal segment. Under no circumstances should barium be used. It is extremely irritating, it is invariably aspirated, and aspiration pneumonia will be induced or, if it is already present, will be exacerbated.

The interpretation of the films is not difficult. In type I there is seen a dilated blind pouch ending opposite the first or second thoracic vertebra. In type III a similar blind pouch is seen. In type I there is no air in the gastrointestinal tract and no lipiodol in the trachea unless it has been aspirated into it. In type II there is no air in the gastrointestinal tract but lipiodol is present in the trachea. In types III and IV there is air in the gastrointestinal tract but no lipiodol in the trachea unless it has been aspirated into it. In type V there is air in the gastrointestinal tract and lipiodol is found in the trachea. This information is of both diagnostic and therapeutic importance: Type III which is fortunately the commonest variety, is the most readily amenable to surgical treatment, while types IV and V also lend themselves well to anastomosis. Haight<sup>2</sup> has estimated that when air is seen in the gastrointestinal tract on roentgenography, as it is in all three of these types, anastomosis is possible in approximately 83 per cent of all cases, while it is possible in only 20 per cent of the cases in which air is not present.

The routine use of tracheoscopy, as recommended by Byron<sup>11</sup>, would no doubt increase the proportion of correct preoperative diagnosis, but the risk of edema seems a heavy price to pay for the possible benefits.

The child should always be examined completely because of the likelihood that other anomalies will be present, particular-



ly imperforate anus. All series call attention to this possibility. Seven of the 26 patients treated at the two New Orleans hospitals presented associated anomalies. Two had horseshoe kidneys, 1 a diverticulum of the ileum, and 1 a bipartite uterus and vagina with a persistent cloaca. The 3 other patients in this group all had imperforate anus, in one case associated with dextrocardia and in another with agenesis of the gallbladder and possibly atresia of the bile ducts, though the autopsy protocol is not clear on this point. With the possible exception of the last case, none of the associated anomalies threatened life or, if they did, were beyond surgical correction.

#### OPERATION

A few children with small esophageal fistulas have survived for variable lengths of time,<sup>8</sup> but when atresia is present life is incompatible with it without surgical relief. Moreover, as Richter<sup>12</sup> emphasized in 1913, ligation of the fistula is essential. The long record of failure in the cases in which this step was omitted is clear indication of its necessity.

Some form of inhalation anesthesia is best for the patient and simplifies the procedure for the surgeon. In my last two cases cyclopropane was used, with excellent results.

The surgical approach depends upon the type of anomaly present, which determines, in turn, whether or not anastomosis is feasible. If it is, the incision of choice is usually a right-sided extrapleural approach to the mediastinum. In the two cases in which I used a right-sided retropleural approach exposure was better than in the third case, in which the approach was from the left. In that case retraction of the heart was followed by cardiac disturbances and the arch of the aorta hampered manipulations. Lyon and Johnson<sup>13</sup> seem to be alone in recommending a transpleural approach.

Posterior resection of segments of the second, third and fourth ribs, and sometimes of the fifth rib also, is usually part of the procedure, though Bigger<sup>1</sup> has recently advocated a retropleural approach through the bed of the resected fourth rib.

It is difficult to avoid damaging the pleura, in spite of careful manipulation.

It is frequently necessary to divide the azygos vein between ligatures, to permit visualization of the lower esophageal segment and its communication with the trachea, as well as to identify the vague nerve. The blind proximal segment of the esophagus is then sought for in the superior mediastinum. Sometimes it is necessary to insert a catheter before it can be located and mobilized. After the fistulous communication of the lower segment is ligated and divided as close to the trachea as possible, the upper pouch is opened, and the segments are anastomosed by simple end-to-end suture or by a telescoping technic. Technical difficulties are frequent because the lower segment is likely to be small and poorly developed while the upper segment is usually dilated and hypertrophied. Tension on the suture line must be avoided as far as possible, as it is usually followed by leakage, though the development of a fistulous tract is not necessarily fatal. The lung is then re-expanded and the wound is closed in layers, a small drain being left in the mediastinum. I am not in favor of leaving a catheter in the esophagus, as pressure at the anastomotic site may predispose to leakage.

Since oral feedings are contraindicated for twelve to fourteen days after operation, gastrostomy is a necessary part of the operative procedure. Ordinarily it is done twenty-four to forty-eight hours after the anastomosis, but Bigger<sup>1</sup> has recommended that it be done as the first phase of operation. I used this order of procedure in my own successful case, to relieve distention of the gastrointestinal tract and to secure more time for preparation, since the child was an extremely poor risk, but at the time Bigger's recommendation had not come to my attention. When oral feedings have been instituted successfully, the gastrostomy is permitted to close. The Stamm technic is usually employed.

If primary anastomosis is not possible, as it usually is not in types I and II of this anomaly, the choice of operation lies be-

tween the formidable transthoracic esophagogastrostomy suggested by Byron<sup>11</sup> and a staged procedure consisting of ligation of the fistula, upper (cervical) esophagostomy, lower (thoracic) esophagostomy, and after a considerable time, connection of the esophageal stomas by means of the simplified plastic procedure described by Lam.<sup>14</sup> Sweet,<sup>15</sup> in order to avoid the extensive plastic operations necessary in the construction of an anterior esophagus, has suggested that the stomach be mobilized through the thorax and anastomosed to a previously formed cervical esophagostomy in the cervical region.

#### PREOPERATIVE AND POSTOPERATIVE CARE

The prevention of aspiration pneumonia and the maintenance of a proper fluid balance are the chief considerations of preoperative preparation in a child which tracheoesophageal fistula. To prevent pneumonia, the head should be lowered and continuous suction or, better, repeated catheter aspirations should be carried out. If atelectasis or pneumonia is already present, it is well to adopt Haight's<sup>7</sup> suggestion and keep dependent the side on which the incision is to be made.

The correction of dehydration and the maintenance of a proper fluid balance are important both before and after operation, but fluids must be administered cautiously, to avoid the development of edema. Saline solutions are particularly likely to cause this complication, and it is probably better to err on the side of conservatism and limit fluid administration to dextrose solution and Ringer's solution. The administration of potassium is important, but in the absence of easily available methods of measuring potassium blood levels, great caution must be exercised in its use. Blood is usually not urgently needed in the preoperative period, but is essential in the postoperative period, since the loss at operation is frequently much greater than is realized.

Penicillin is given before operation, as a prophylactic measure against pulmonary infection which may develop, or as a therapeutic measure if it already exists. After operation it is continued, in the amount of

10,000 units every three hours. Other antibiotics and the sulfonamides are employed according to the indications.

The child is placed in an incubator and is given oxygen continuously. The pharynx is aspirated at intervals if mucus accumulates. Nothing is given by mouth for ten or twelve days after operation. Then, if primary healing has occurred, feedings are begun in gradually increasing amounts. If leakage has occurred at the suture line, they are withheld until the fistula closes.

There are few other conditions in which, both before and after operation, closer cooperation is necessary between the pediatrician and the surgeon. I am quite certain that the excellent attention of the pediatric residents had much to do with the recovery of the child in my own successful case, the history of which is appended, for the record.

#### CASE REPORT

A white male child was admitted to Charity Hospital of Louisiana at New Orleans, January 11, 1949, on the tenth day of life, with a history of regurgitation with choking and cyanosis at every attempt to feed him or give him water. He had had no treatment except for a daily hypodermoclysis. Examination revealed a small, malnourished and greatly dehydrated infant, in poor physical condition, with signs of pneumonia in the right chest. A catheter passed into the esophagus encountered an obstruction at the level of the second rib anteriorly. A plain roentgenogram of the abdomen and chest confirmed the diagnosis of pneumonia and revealed gas in the stomach and intestines. A second roentgenogram, following the injection of lipiodol into the esophagus, showed that its upper portion ended in a blind pouch.

Preparation for the operation consisted of blood transfusions, penicillin by the intramuscular route, and the intravenous administration of 5 per cent dextrose solution, amigen, lactate-Ringer's solution, and sulfadiazine. Thirty-six hours after admission, when the child's initially poor condition had greatly improved, a Stamm gastrostomy was performed under local analgesia. The following day the tracheoesophageal fistula, which was of the type III variety, was ligated and an end-to-end anastomosis was performed. The right-sided retropleural approach was used, with ligation and division of the azygos vein. Drainage was instituted by means of a small rubber catheter. Operation was without incident except that the pleura was accidentally entered.

The postoperative regimen included blood transfusions, intramuscular injections of penicillin, and



intravenous infusions of dextrose solution. Feeding via the gastrostomy was begun the day after operation and oral feedings of a standard formula were begun eighteen days later. When the patient was discharged on the seventieth postoperative day he weighed over 8 pounds, approximately 3 pounds more than his preoperative weight. He was taking all his feedings, including cereals, by mouth without difficulty. The gastrostomy had been permitted to close.

The child has been seen in the clinic several times since his discharge. Ten months after operation he weighed 18 pounds but because his mother reported that he sometimes choked on solid foods he was hospitalized for observation. Examination of the esophagus with an opaque meal showed some narrowing at the site of anastomosis but no delay in the passage of the material. The nurses, who were instructed to watch him carefully, reported that he regurgitated his food only when he was emotionally upset at feeding times. An otolaryngologist saw the child in consultation and dilated the strictured area through an esophagoscope. A repetition of this measure may be necessary, though most observers are agreed that constrictions of surgical origin, unlike lye constrictions of the esophagus, seldom require more than one or two dilatations.

#### SUMMARY

Tracheoesophageal fistula, which was formerly a hopeless anomaly, is now amenable to surgical correction, by anastomosis of the esophagus and ligation of the fistula, with a steadily improving mortality. Prompt diagnosis and careful preoperative and postoperative management are essentials of success. The important clinical details of the condition have been outlined, and another successful case has been recorded.

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## LUETIC AMYOTROPHIC MENINGOMYELITIS CASE REPORT

H. THARP POSEY, M. D.

NEW ORLEANS

Kinnier Wilson says of this condition, "In respect of severity, evolution and site, lesions differ widely, and they are sometimes combined in such a way as to form links with other widely recognized types." Unfortunately, what with "practical" specifics for the treatment of syphilis of all forms in later years, little has been added to the modern commonly used neurological and medical texts to bring more diagnostic exactitude to a condition so variable in expression as Wilson has indicated, nor does the modern journal literature often mention this disorder. If Wilson's citing of workers and "authorities" of the last century and the first three decades of the present one today be granted the validity he attributed to them, Osler's dictum of the protean nature of syphilis is especially corroborated by spinal syphilis.

The following case is one in point. It is conceded that, if it be considered a *sine qua non* of the diagnosis, no *T. pallidum* were found.

From the Neuropsychiatric Section, VA Hospital, New Orleans, and the Department of Psychiatry, Tulane University School of Medicine. Published with the permission of the Deans' Committee of Tulane University and Louisiana State University.

## CHIEF COMPLAINT AND PRESENT ILLNESS

This 58-year-old white male was admitted October 4, 1946 with a chief complaint of inability to walk or use his hands, massive progressive weight loss, and general debility. There was no psychiatric complaint.

The present illness was said to have begun in April, 1946, with intermittent claudication. Prior to this time, entirely good health was claimed. He complained of pain in his calves and feet, and progressive fatigue. The pains in the calves were described as "cramps, as if the leaders were shortened." The pains would disappear after rest following a day's work. In late April, the patient saw his company physician who prescribed vitamin tablets which gave no relief. In May, he was forced by his disabilities to cease work and he entered his company hospital for treatment. There he was told he had a urinary infection and he received five injections of penicillin. In addition, all his teeth were extracted. He was told his blood Wasserman was four-plus. He did not improve at all at that hospital and was referred to a private physician in Port Arthur, Texas. This physician performed a diagnostic lumbar puncture in the course of his care and took another blood Wasserman. The former was allegedly negative and the latter strongly positive. The physician placed the patient on weekly injections of bismuth and the patient took five before deciding he was getting worse and entering another hospital in August. Prior to this time, he had become totally unable to walk in early June due to weakness of both feet. During his thirteen-day stay in the private hospital, he received 7,800,000 units of penicillin in eight days, and heavy doses of B-complex. A blood serology on August 24, 1946 was reported negative (verified). Leaving the hospital Maximal Benefit, he convalesced at home. The disease progressed, however, and by mid-September he had lost the use of his hands. A month before admission to VA Hospital, New Orleans, he suffered an attack of transient

dyspnea which cleared without any difficulty.

Review of systems was negative except for neurological difficulties.

## PAST PERSONAL HISTORY

Patient gave a history of a penile chancre in 1914, for which he sought early treatment and was given four injections of salvarsan, after the second of which the lesion began to heal. He received no more antiluetic or other treatment. In general, his health was good until the onset of the present illness, except for falling in weight from over 215 pounds to 161 on admission. In 1944, he had had some "fatty tumors" excised from his left forearm without sequelae, and one year before admission here, he had had a transient swelling of the ankles which he attributed to "kidney trouble" and for which he took no treatment. His early medical history included the usual childhood diseases and typhoid, from each of which he recovered uneventfully.

The patient spent one year in the Army during World War I, saw no overseas service, earned no promotions, awards, and stood no courts-martial. After Army discharge, he was employed as a mechanic by the T. & P. Railroad and remained so until the present illness forced him to cease work. The marital history was negative and children living and well. The wife had no miscarriages. Patient was a consistently heavy smoker, drank only an occasional beer.

## FAMILY HISTORY

Family history was noncontributory. The father had died of a "stroke," the mother of hypertension. For a number of years before her death, the mother had had a "crippling arthritis of the hands."

## GENERAL PHYSICAL AND NEUROLOGICAL EXAMINATIONS

The positive findings on the general physical examination were: (1) weight 161, height 71 inches; (2) tonsils atrophic; (3) edentulous; (4) scattered fine rales over both bases posteriorly; (5) liver border 5 cms. below the costal margin; (6) prostate not examined; (7) moderately severe pitting edema of ankles and feet; (8) old pigmented circular scar, d-6 cms., an-



tero-medio-distal aspect left leg; (9) bilateral trichophytosis pedis; (10) no penile scar.

The positive findings on the neurological examination were: (1) hyperhidrosis of the palms; (2) moderately severe atrophy of the temporalis and masseter bilaterally; (3) moderately severe atrophy of anterior and posterior neck muscles bilaterally; (4) posture quadriplegic in flexion; (5) generalized atrophy of the muscles of the arms and forearms bilaterally but more pronounced in forearms; (6) bilateral severe atrophy of the first lumbrical with mild atrophy of the interossei and other lumbricals bilaterally; (7) bilateral severe quadriceps atrophy; (8) bilateral severe peroneus and gastrocnemius atrophy; (9) generalized hypotonus of all extremities; (10) total paraplegia from below knees bilaterally. On active flexion of the thighs with marked effort, there was passive flexion of the legs; (11) bilateral wrist drop with total paralysis of the hands and fingers; (12) obvious fasciculations over both pectorales majores; (13) the upper and lower abdominal reflexes were present but sluggish. The cremasteric reflexes were active bilaterally. The biceps were present bilaterally but sluggish. The jaw jerk was active. All other reflexes were absent. There were no pathological reflexes; (14) there were no meningeal signs; (15) bladder function was subjectively normal; (16) rectal sphincter exhibited normal tone; (17) there was a generalized hypesthesia of the lower extremities bilaterally; (18) stereognosis was bilaterally absent in the hands but barognosis was present and normal; (19) there was hyperalgesia of deep sensation in both lower extremities; (20) there was an indefinite disorder of temperature sensibility over all extremities but in the forearms and hands primarily confined to difficulty in identifying warmth; (21) position sense in the hands and feet was completely disordered; (22) vibratory sense was markedly reduced over all extremities. Two-point sensibility was not tested.

#### LABORATORY FINDINGS

Complete blood counts: Oct. 7, 1946, RBC 4.63, WBC 8.2 with N.73, L.20, M.6, E.1; Dec. 11, 1946, RBC 4:38 with Hb.85, WBC 6.8, with N.64, L.32, M.2, E.2; Dec. 20, 1946, RBC 4.72 with Hb.95, WBC 9.95 with N.71, L.27, M.1, E.1.

Sed. rate Oct. 9, 1946: 30 mms.; Nov. 7, 6 mms.; Dec. 7, 12 mms.; Dec. 20, 12 mms.

The first five urinalyses shortly after admission showed variously traces of albumin and pus cells varying from a few WBC to gross pus; subsequent urinalyses entirely negative. Fishberg, Oct. 9, 1946: 1019, 1015 and 1020.

Total serum protein and A/G ratio: TP 6-2, A 3.9, G 2.3, A/G ratio 1.7.

Six separate blood Kahns and Kolmers were all positive.

Fasting blood sugar 95. NPN 42.

Complete spinal fluid survey in lateral position Oct. 7, 1946: IP 13 cms, TP 9 cms, 15 lymphocytes, Wasserman and Lange negative, total protein unobtained. Oct. 8, 1946, 5 lymphocytes, Wasserman and Lange negative, total protein 190 mgs. per cent. Oct. 14, 1946: 5 lymphocytes, Wasserman positive (44320), Lange 3445522100, total protein 207 mgs. per cent.

X-ray of the chest on admission revealed clear lung fields and normal cardiac silhouette but the left costophrenic angle was obliterated and there was evidence of old adhesions in the left leaf of the diaphragm. X-ray of skull on admission was negative. X-ray of the sinuses on admission showed minimal clouding of the left maxillary sinus. X-rays of both tibiae on admission showed a shadow of calcific density in the anterior soft tissue at the junction of the middle and proximal thirds of the left tibia. No evidence of bony pathology was noted.

Electrocardiogram Oct. 9, 1946, reported as "Strongly suggestive evidence of myocardial disease; may be compatible with chronic emphysema." The recording was reported by the technician as being poor, repeat was requested. Repeat electrocardiogram reported as "Low voltage QRS and T complexes may be due in part to

emphysema. Strongly suggestive evidence of myocardial ischemia in addition."

#### CONSULTATIONS

Consultation was had with the Medical Service for diagnosis and treatment of the medical condition. The consultant stated he was not familiar with the clinical picture presented but did not consider that further antisyphilitic therapy was indicated. A second consultation was requested with Medicine after the electrocardiographic report. The consultant was of the opinion that the cardiac and renal findings were simply incidental to the primary disease. Consultation was had with Urology because of the urinalysis findings and the history. Consultant reported evidence of mild prostatitis but considered the remaining symptoms as being compatible with chronic glomerulonephritis. He was of the opinion that no urological excretory lesion appeared evident at the time, and suggested study of the serum proteins. Consultation was had with Ophthalmology because the discs appeared slightly hazy and there seemed to be a slight temporal pallor OD. A consultant considered the findings physiologic. A small spindle shaped, dark area measuring .5 mms. by .1 mms. was found immediately superior to the disc OS along the superior temporal venule. Its significance was not established.

#### COURSE IN HOSPITAL

After the initial work-up had been completed, the case was diagnosed to be one of progressive muscular atrophy of an undetermined type by some, and by the writer a case of luetic amyotrophic meningomyelitis. In view of the consistently positive blood serology and one positive CSF serology, treatment was begun on the latter assumption and the patient was given 8,000,000 units of penicillin and ten weekly injections of bismuth subsalicylate. In addition, he was given one ampule of Solu-B (1x) intramuscularly daily, and by mouth massive doses of ferrous sulphate, vitamins A and D, and ascorbic acid. Nineteen days after admission, having received 1,440,000 units of penicillin and one injection of bismuth, in addition to the massive vitamin therapy

since admission, the patient stated that he was considerably improved and much stronger. He was truly quite alert and interested in his surroundings, laughed readily, ate well and slept well, but there was no other evidence of improvement. In fact, the staff was of the opinion that the atrophy, particularly of the face and neck, was progressing noticeably. Furthermore, there was no change in the edema of the feet and there was a consistent slow fall in weight. As noted under laboratory findings, the sedimentation rate had fallen from an initial high of 30 to 12 and the patient remained afebrile as on admission. After the patient had been given 8,000,000 units of penicillin, he was sent to physiotherapy every other day where he received passive exercise, radiant heat, and massage. After about a week of physiotherapy, the patient had regained the most minute use of his fingers and feet in that he could just flex the tips of his fingers enough to be perceptible and was able to initiate a movement of extension with both feet. It was thought that this return of function and marked subjective improvement was an indication that treatment was arresting the disease progress, yet every ward round led to comment that the patient's face was growing more and more gaunt day by day and one could not escape the impression of slight dyspnea in spite of the fact that the patient denied any difficulty in breathing. On the fifty-fifth day of admission, and without apparent cause, the patient displayed an acute respiratory failure and it was necessary to place him in an iron lung. There were no immediate signs of cardiac embarrassment or pulmonary congestion. He spent almost two entire days in the apparatus and then was able to be removed from it for increasingly longer periods. After a week, he was able to be out altogether and remain comfortable. A week later he resumed physiotherapy and was frequently up in a wheelchair thereafter. He continued to insist that physiotherapy was strengthening his arms and legs although there was no evidence of this beyond that already described.



On the eighty-second hospital day, respiration became acutely rapid and the patient asked to be returned to the respirator which was done. By the time he was placed in the respirator, he was perspiring profusely, pulse was 116, respiration 28 and he was complaining of pain in the right lung. His condition grew rapidly worse from that time. Pulse, temperature, and respiration rose slowly but steadily and the physician and attendant were unable to synchronize the patient's respiration with the respirator. On the third day after being returned to the respirator, the patient became semistuporous and pulse varied between 120 and 140 and respiration between 20 and 30. Respirations were extremely labored. In the agonal state of the next ten hours, the pulse became almost uncountable, respiration markedly irregular and rapid and the temperature rose to 107 at the hour of death on the eighty-sixth hospital day.

Autopsy resulted in diagnoses of: (1) Myeloma, lymph nodes, hilar, (2) Cerebrospinal congestion and edema, (3) Bronchopneumonia, bilaterally, lower lobes, (4) Pulmonary abscesses, left lower lobe, (5) Mitral and aortic valve atherosclerosis, (6) Hepatomegaly, (7) Splenitis, septic, (8) Nephrosclerosis, benign, (9) Aortic atherosclerosis, (10) Prostatic hyperplasia, (11) Pleural adhesions, between parietal and visceral pleura, and between all lobes.

The specimens of the central nervous system were submitted to the Army Institute of Pathology where examination was done by Dr. Webb Haymaker who reported as follows:

"The most striking finding consisted of loss of nerve cells in anterior horns. The remaining cells were often shrunken or otherwise distorted. The distribution of cell loss varied a good deal, generally being most pronounced in the intermediate and lateral portions of the anterior horns. Occasional vessels in the anterior horns were surrounded by a few lymphocytes. Anterior roots showed considerable degeneration of myelin and axis cylinders, and the same was true of some of the posterior roots. The latter finding is borne out in

one section from the cervical cord in which the Weil stain disclosed mild degeneration of myelin in the more medial part of the fasciculus gracilis. The case is regarded as one of syphilitic amyotrophy.

#### SUMMARY

A case of clinically diagnosed luetic amyotrophic meningomyelitis with histopathologic confirmation is reported.

NOTE: Thanks are due to Mr. William Gude, Department of Anatomy, Tulane University, for the variety and excellence of the special stains.

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## A BURN INVOLVING EIGHTY PER CENT OF THE BODY WITH SURVIVAL

REPORT OF A CASE  
WARREN L. ROSEN, M. D.

NEW ORLEANS

Few patients, if any, have survived a burn involving more than 65 per cent of the body surface. Pack<sup>1</sup> has stated that "all burns of the first degree are fatal if two-thirds of the body surface is involved, and all burns of the second degree are fatal if one-half of the body surface is involved." He also stated that "scalds are more serious area for area, and depth for depth than thermal traumas due to dry heat." This opinion has been shared by others such as Christopher<sup>2</sup>, MacLeod<sup>3</sup>, and Lund<sup>4</sup>. I, herewith, wish to report a case of a scald with survival, that involved over 80 per cent of the body surface according to the accepted Berkow tables.<sup>5</sup>

#### REPORT OF A CASE

T. L., negro male, age 39, a worker in a large cotton mill, was first seen in the Emergency Room at Touro Infirmary at 4:30 AM, October 3, 1947. The history obtained was that he had been instructed to mix a large vat of dye and in so doing, the tank had exploded covering him with scalding water. Later investigation revealed that the proper procedure was to heat a large tank of water to boiling, start a mechanical agitator and add the powdered dye. He had heated the water to boiling point but forgotten to start the agitator so that when the powder was added it formed a solid film over the top of the tank of water causing the

Senior Surgeon, Touro Infirmary.

water to boil over. He had been covered from head to foot with this boiling water and powdered dye and severely burned.

*Examination and first aid:* He was first seen by the intern on accident service, who did not realize the magnitude or seriousness of the burn, and seeing him covered with a blue dye, sent him with an orderly for a shower bath. I arrived a few moments later while he was in the shower. He had been stripped and it was noted that his entire body had been burned. (see Table I for chart of his burns). He was in mild shock, pulse rate 106 per minute, and blood pressure 100/60 mm., and he

TABLE I  
BERKOW'S TABLE

	% Normal Area	Burned Area
Head .....	7	4
Neck .....	2	2
Chest .....	13	13
Back .....	13	13
Up. Arms .....	8	8
Forearms .....	6	6
Hands .....	5	5
Genitals .....	1	—
Buttocks .....	5	2
Thighs .....	19	14
Legs .....	14	10
Feet .....	7	4
	100%	81%

was complaining of severe pain. He was given morphine sulphate 1/4 gr. and an infusion of plasma was started. Because of the extensive burned surfaces and the collapse of the superficial veins it was necessary to cut down on one of the anterior tibial veins above the ankle to get the infusion started. No further attempt at cleansing the burns or any debridement was made and all the burned surfaces were covered with fine mesh gauze impregnated with vaseline. This was covered with dressings of five yard rolls, and slight pressure made with elastic Ace bandages. His neck, chest, abdomen, back, both arms, forearms, and hands, thighs, legs, and feet were similarly treated. His face, head, and eyes were also burned but no dressings were applied to these parts except a protective coating of plain vaseline. The dressings took about two hours to apply at which time he had received 500 cc. of plasma. He was then transferred to a private negro hospital in an ambulance.

*Course in Hospital:* On admission to the hospital, his temperature was 98°F., pulse rate 84 per minute, respiration 30 per minute, and blood pressure 110/60 mm. A hematocrit was reported as 52, so an additional 500 cc. of plasma was given following the rule of Harkins that 100 cc. of plasma should be used for each point the hematocrit is above normal. Besides this he was given

1000 cc. of 1 per cent saline in 5 per cent glucose. Penicillin was started in doses of 30,000 units every three hours and this was continued until October 28, at the time of his second dressing. He was encouraged to take fluids by mouth and received at least 3500 to 4000 cc. daily. Opiates were ordered to relieve pain but following his original dressing, he remained comfortable, and it was only necessary to give him three doses of codeine sulphate 1/2 gr. tablets, to relieve any discomfort during his hospital stay. A blood count made October 4, 1948, showed total red blood cells of 4,340,000 with hemoglobin of 95 per cent. White cell count was 10,450 with 74 per cent neutrophils, 23 per cent lymphocytes, 3 per cent large mononuclears. Urinalysis showed specific gravity of 1.016 with no albumin, no sugar, and no red blood cells or casts in the sediment. A check of the urine was made daily during his hospital stay and at no time did it show any abnormality. The specific gravity remained constantly above 1.014 and there was never any albumin. A hemoglobin determination, made October 21, 1948, was 70 per cent, and red blood cells were 4.3 million.

He was seen in consultation by Dr. W. M. Boles for his eye condition, and this proved to be only superficial burns of both cornea which responded rapidly to treatment. He was kept on a high protein diet of 200 grams with 4000 calories, and ate well. It was never necessary to repeat infusions as he remained well hydrated and although we were never able to get plasma determinations, his general condition remained so satisfactory that we did not feel it necessary to supplement his feedings with extra protein or blood. On October 13, ten days following his injury, he was taken to the operating room and under sterile precautions was dressed. The Ace bandages had become loose by this time and had become uncomfortable. Without any anesthesia, the dressings were removed, the burned areas washed with soap and warm water, and then re-covered with fine gauze impregnated with vaseline and large dressings of gauze. These were then covered with new Ace bandages. There was evidence that all burned areas were healing, and only in a few places were there areas of deep granulation. When the original dressings were removed, all the superficial skin that contained black pigment came off with the gauze and almost his whole body was red instead of black. The burns of his face had almost healed during these ten days and this was the only part of the burned area that showed repigmentation. Unfortunately, photographs were not made at this time as the contrast was striking between the red areas of healing and the few original parts of black skin. He was not dressed again until October 28, twenty-five days following the burn, at which time photographs were made in the operating room (see attached photographs).





These photographs were made October 28, 1947, or twenty-five days following the burn. The face had completely healed by this time. The darker

areas represent the only areas of skin which were not burned.

By this time, his face had completely healed and become fully pigmented again. The areas as shown in the photographs were still red although they showed some beginning pigmentation. Only a few small areas over his sacrum, shoulders, and elbows showed granulating areas. These were dressed and the patient was discharged on October 31, and told to report to the office for further treatment.

*Progress:* The small areas over his shoulder, elbows, and sacrum were dressed three times a week for the next four weeks and finally all areas healed without the need for grafting. There were no constricting scars and all joints were freely movable. After his discharge from the hospital, his diet was supplemented with high vitamin concentrate tablets and extra protein in the form of Protenum. He was allowed to return to his job January 5, 1948, about three months following his burn, at which time he was completely healed and well.

#### COMMENT

Of the patients admitted to the Massachusetts General Hospital for treatment of

burns received in the Cocoanut Grove fire, only 1, (case No. 13), recovered following extensive burns. This patient had 56 per cent of his body surface burned and remained in the hospital a total of one hundred and forty-three days.<sup>6</sup> I was able to find 1 other case of recovery following extensive burns, a case reported by Bettman in which 80 per cent of the body surface was burned.<sup>7</sup> Lam reported no cases of burns living if 75 per cent of the body was involved.<sup>8</sup> I am fully in accord with Lam<sup>8</sup> that it is "not foolish but wise to apply a good local dressing" when the patient is first seen. These burns were not debrided or cleaned except that the patient was placed under a shower of running water and no body surface was touched. No blisters were opened and only vaseline gauze was used with slight pressure dressings.

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SULFADIAZINE ANURIA, A LOWER  
NEPHRON NEPHROSISTREATMENT WITH INTRAVENOUS  
PROCAINE

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Acute anuria, regardless of cause, presents the urologist with a most serious problem. Acute anuria secondary to pathological changes in the renal architecture, most commonly seen in the so-called lower nephron nephrosis syndrome, is one of the most difficult problems the urologist faces.

The present day routine treatment of lower nephron nephrosis is divided into three phases: (1) Treatment of shock if present. (2) Treatment of the anuria with special attention to a minimum fluid intake. (3) Treatment of the diuretic phase when established. These phases are common knowledge to the urological profession.

It is in the second phase of treatment that one tends to become discouraged and it is in this phase that suggestions are most readily sought and accepted. Early decapsulation is recommended quite often in the literature. From personal experience, one of us (ARB) has been very disappointed with the results in his use of that procedure. It is therefore with considerable enthusiasm that we call attention to an article by Friis<sup>1</sup> entitled "Sulfathiazole Anuria Cured by Means of Intravenous Procaine Treatment," and present a case of our own treated by intravenous procaine in addition to the present day accepted therapy. One case does not justify any positive statements, but certainly from our

observation it does seem worthwhile that others try this method of therapy.

## CASE REPORT

A 47 year old male, was treated with sulfadiazine by his family physician for an infection of his right arm. Prior to the arm infection the patient had been in excellent health. Following the administration of 18 grams of sulfadiazine the patient began to have some gross hematuria. There was no pain with the passage of the blood. With the onset of the hematuria oliguria appeared. The oliguria became progressively worse, and when we first saw the case on August 23, 1949, the patient was anuric. The NPN was 63, the creatinine was 7.15. Cystoscopy showed no evidence of ureteral blockage and no sulfadiazine crystals were noted in the washings. Vermooten<sup>2</sup> has called attention to the use of continuous gastric lavage. It is a very simple procedure requiring the use of tap water only for the lavaging medium. This type of lavage was instituted at the time of admission and served to keep the patient in relatively good condition throughout his period of anuria. Anuria had been present forty-eight hours and the NPN was 85 when 15 cc. of 1 per cent procaine were given intravenously on August 25, 1949. Immediately following the injection of the procaine the patient complained of pain over both kidneys and 50 cc. of bloody urine were passed through an indwelling urethral catheter during the next hour. No further urine was passed for the next twenty-four hours. At this time, on August 26, the procaine injection was repeated and during the next twenty-four hours the patient passed 100 cc. of urine. On the following two days, August 27 and 28, the patient passed 650 and 600 cc. of bloody urine, respectively. However since no urine was passed during the last twelve hours of August 28 or the first fifteen hours of August 29 and since diuresis seemed to have ceased, 15 cc. of 1 per cent procaine were again given intravenously about 3 P.M. on August 29. Diuresis immediately began and in the next twelve hours 925 cc. of urine were passed. By noon on August 30 urine was pouring from the catheter and on that day 5590 cc. of urine were passed. Then 4175 cc., 5300 cc., 5650 cc., 4420 cc., and 3279 cc. were passed respectively on the following five days and the patient began to recover rapidly. On September 6, the eighth day after full diuresis began, the patient was discharged from the hospital.

Throughout the entire course of the illness fluid intake was carefully regulated. Daily NPN, creatinine, CO<sub>2</sub> combining power, and serum chloride determinations were made. Gastric lavage was discontinued as soon as diuresis was in full force.

## SUMMARY

The use of intravenous procaine in acute anuria is recommended for trial following



observations made on a case of sulfadiazine anuria.

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## FRACTURES OF THE UPPER END OF THE FEMUR

### AN ANALYSIS OF ONE THOUSAND CASES

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It has been stated that fractures of the upper end of the femur have the highest morbidity and mortality of any simple fracture of the long bones in middle and advanced age. The population is rapidly aging. Every year a greater proportion of the public is over 65 years of age than during the preceding year. Today there are 9,000,000 individuals over 65, and it is estimated that by 1980 this group will number over 22,000,000. Because fractures of the upper end of the femur occur in an older age group, the handling of these patients will constitute a major surgical problem.

Conservative treatment, which was formerly advocated for all cases of fracture of the upper end of the femur, has produced such poor results that more radical treatment is gradually replacing it. This is especially true of intracapsular fractures in which operative intervention has been followed by a far greater incidence of union and a lowering of the morbidity and mortality. While it is generally believed that intracapsular fractures are better treated by some form of internal fixation, there is some difference of opinion as to whether intertrochanteric and subtrochanteric fractures are best treated conservatively or radically. The development of

surgical technics and improvements in anesthesia have made possible the salvaging of many patients who formerly would not have survived. Operability and mortality rates are improving, due, perhaps, to the use of antibiotics and chemotherapy in the prevention and treatment of pre and postoperative complications, and also, to a better understanding of surgical shock, blood volume, and thrombo-embolic complications.

The purpose of this report is to present a review of 1,000 cases of fracture of the upper end of the femur treated at the Charity Hospital of Louisiana in New Orleans. All of these cases were acute, fresh fractures; no pathologic fractures were included. The patients were admitted in rotation to four services. These statistics, therefore, represent the work, not of one surgeon, but of a representative group. An analysis and an evaluation of the methods of management exercised in these 1,000 cases may, therefore, yield information that will influence the selection of the future treatment of the patient who has sustained a fracture of the upper end of the femur.

#### AGE, RACE, SEX OF PATIENTS

The 1,000 patients studied ranged in age from 4 to 104 years. The average age of this group was 66.6 years. There were 522 white females, 306 white males, 102 colored females, and 70 colored males. There were 826 white and 172 colored patients, a ratio of approximately 7 to 1. The ratio of white females to males was 1.7 to 1, and the ratio of colored females to males was 1.45 to 1.

#### MORTALITY

There were 247 deaths, a mortality of 24.7 per cent. Of these 1,000 patients, 453 were treated by conservative measures and 143 died, a mortality of 31.5 per cent. The remaining 547 were treated by surgical means and 104 died, a mortality of 19 per cent. It is apparent that there is a significant difference between the mortality for those treated conservatively, 31.5 per cent, and for those treated by surgical intervention, 19 per cent. These figures will be broken down further for the different types of fractures of the upper end of the femur.

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## TYPES OF FRACTURES

Fracture of the upper end of the femur may be classified as intracapsular, intertrochanteric and subtrochanteric. The intracapsular fractures may be further divided into subcapital, transcervical, and basilar, depending upon where, anatomically, the fracture line exists. The subcapital fracture is high on the neck and presents a problem in that it is quite difficult to get a good reduction and the incidence of nonunion is high. The transcervical fracture is through the middle of the neck and more distal than the subcapital fracture. The basal type is low on the neck near the trochanter but still within the capsule. Unfortunately, it was impossible to learn from the x-ray reports the exact anatomic location of the intracapsular fractures. These were reported as fractures through the neck or as intracapsular fractures as long as they appeared to be within the capsule of the hip joint. The x-ray department could be of great assistance by reporting accurately just where on the femoral neck the fracture line exists and the angle of the fracture, as these data are of considerable importance in the prognosis as to union.

## INTRACAPSULAR FRACTURES

In this group of cases there were 504 intracapsular fractures. The youngest patient was 4 years of age, the oldest 104. The average age for this group was 66.3 years. There were 107 deaths, a mortality of 21.2 per cent.

Two hundred and seventy-eight patients were treated by conservative measures, including bed rest, manipulation, application of plaster casts, and some form of traction—Euck's extension, Russell traction, balanced skeletal traction, or Roger Anderson's well leg traction. There were 73 deaths, a mortality of 26.2 per cent. Only 12 patients could be followed for a period of a year or longer. In 43 per cent of these there was bony union.

Two hundred and twenty-six patients were treated by some form of internal fixation. The most common method of fixation was the use of the Smith-Petersen nail

or double screws, all applied by the blind nailing method (the hip joint was not opened). There were 34 deaths, a mortality of 15 per cent. Of 78 patients followed for a period of a year or longer, 54 (69.8 per cent) showed bony union. Forty-seven of these surgically treated fractures had been fixed with Smith-Petersen nails and this technic produced 29 unions and 18 non-unions, a union rate of 61.7 per cent. The other 31 neck fractures were fixed with double screws. Of these 25 united and 6 showed evidence of nonunion, a union rate of 80.6 per cent.

*Comment.* There are many factors that influence union in this type of fracture. Damage to the superior and inferior capsular vessels, and vessels in the ligamentum teres, retards union just as accurate reduction and proper fixation with elimination of shearing stress promote it. Various types of nails, screws, pins, and bone grafts have been devised and employed to hold the fragments until union has taken place. Screws are mechanically more perfect for holding two fragments together than are the other means. They draw the proximal fragment to the distal fragment, are less traumatizing on insertion, and are relatively free from the danger of rotating or pushing the head away, which occasionally occurs when a large nail is driven. The proximal fragment, to unite, must be revascularized from the distal fragment and the bone of the proximal fragment must not be damaged if a good result is to be expected. The large Smith-Petersen nail cuts the neck and head into three compartments and occupies a large part of the neck and head. New formed blood vessels must grow around the nail. Screws or pins occupy less space and blood vessels may even grow in between them. Our experience with double screws in private practice fully confirms the evidence in this series, i. e., that the use of wood-type screws offers about 22 per cent greater chance for union.

## INTERTROCHANTERIC FRACTURES

There were 438 intertrochanteric fractures. The average age of the patients in



this group was 70.3 years. There were 128 deaths, a mortality of 29.2 per cent.

Two hundred and sixty-three were treated by some form of internal fixation. In this group there were 71 deaths, a mortality of 26.9 per cent.

One hundred and seventy-five were treated by conservative measures, most commonly Russell and the well leg traction. There were 57 deaths, a mortality of 32.2 per cent.

Eighty of the patients were followed for a period of six months or longer. There were no instances of nonunion.

*Comment.* Because intertrochanteric fractures are extracapsular and nonunion rarely results, there are many who believe that this fracture should be treated by conservative measures. Yet the mortality rate was slightly lower, 26.9 per cent, in those who were treated by internal fixation than in those treated conservatively, 32.5 per cent. The difference is not great, but it does show a trend towards a more successful outcome.

The fact that the lowering of the mortality by surgical intervention is not so great as in the intracapsular group can be explained by several factors.

1. If internal fixation is used, the operation is more extensive than that used in fractures of the neck of the femur, and naturally, a higher mortality can be expected.

2. One of the chief difficulties in the application of internal fixation devices in intertrochanteric fractures is that the fracture line is often comminuted. X-ray studies do not always show this and comminution is only found when the fragments are exposed.

3. In our series, the average age of the patients with intracapsular fractures was 66.3, and the older age carries a greater risk.

4. All of the patients in the present series were charity patients with extremely low means. Practically all in this age group were undernourished and many of them had been or were being treated for chronic medical conditions. In a smaller number

of privately treated patients, the mortality was 12 per cent. Funsten and Frankel report a group of 49 cases treated by surgical intervention, with a mortality of only 8 per cent. Again the average hospital stay for this group of patients was 55 days. In some series, patients are allowed to go home on or about the fifteenth day, and should they die at home at some time thereafter, they do not appear in the hospital mortality rate.

Intertrochanteric fractures are an entirely different problem in the young. Since nonunion is practically unknown, any method that will reduce the fracture and maintain it will give good results.

The mortality in this "poor risk" group is admittedly far too high. However, despite the factors enumerated, there is a reduction in the mortality, and there are still other advantages that must be taken into consideration, such as immediate relief from pain, freedom from confinement, and easier maintenance of the general physical condition of the patient.

#### SUBTROCHANTERIC FRACTURES

There were 51 subtrochanteric fractures in this group. The average age was 59.9 years. There were 12 deaths, a mortality of 23.5 per cent. Eleven of the 51 patients were treated by internal fixation and 2 died, a mortality of 18.1 per cent. Of 40 patients treated by conservative measures, 10 died, a mortality of 25 per cent. Twenty-eight patients were followed for a period of six months or longer. There were no nonunions.

*Comment.* (1.) This fracture occurs in a younger age group than the intracapsular and intratrochanteric types. (2.) When displacement does occur, and it usually does, reduction is often difficult and is rarely obtained by closed methods. (3.) The short proximal fragment is abducted by the pull of the strong gluteal muscles. The adductors, which are inserted at a lower level, pull the distal fragment medially. If the fracture line lies below the lesser trochanter, the proximal fragment is also flexed by the iliopsoas. The short rotatores externally rotate the proximal fragments.

(4.) Nonunion is no problem if the fracture can be reduced and maintained. (5.) This can best be accomplished by open reduction which is also accompanied by a lower morbidity and mortality.

#### COMPLICATIONS

Of the 1,000 patients, 341, or 34.1 per cent, developed decubitus ulcers. These varied from small superficial erosions of the skin to large deep sloughs that extended to the sacrum. In diameter they varied from 2 to 20 cm. with considerable undermining. Some patients developed them on the first day in bed. Seventy patients had urinary incontinence, 4 fecal incontinence, and 24 were listed as having both. It is surprising that no deaths in the conservatively or surgically treated group were directly attributed to pulmonary emboli. Furthermore, none of these patients received anticoagulant therapy or had femoral vein ligation. In 260 cases hypertensive heart disease was present in a degree severe enough to make the outcome doubtful. Other complications listed in order of frequency were pneumonia, senile dementia, uremia, postoperative psychoses, cerebral vascular accidents, and diabetes mellitus. It is apparent, therefore, that the presence of severe complicating diseases and their nature exert a significant and often decisive influence on the survival of the patient. Pneumonia or heart disease, or a combination of both, accounted for 89 per cent of the deaths. Pre-existing ailments and complications not directly attributed to the operation were the greatest factor in the mortality rate. Co-operation with the internists and other specialists is essential.

One of the most distressing complications was the loss of the will to live. Many of these patients were alone in the world. They felt that they had outlived their usefulness and were a burden to their children and relatives. Having nothing to look forward to they lapsed into a state of indifference and pursued a gradual downhill course to death. A vigorous and active social service and rehabilitation program would obviously be of great help.

#### ANESTHESIA

Local or a light general anesthesia was the most common anesthetic agent used. Local 1 per cent novocaine alone was used in approximately 30 per cent of the cases. Local 1 per cent novocaine and general anesthesia, with either nitrous oxide or ethylene, were administered in 60 per cent; and general anesthesia alone, either nitrous oxide or ethylene with ether, in 10 per cent.

It is very difficult, and even impossible, to draw any conclusions regarding the effect of any of the anesthetic agents used in this series on mortality as there were no deaths on the operating table or immediately after operation. While pneumonia was listed as causing 42 per cent of the deaths, it could not be definitely stated that the anesthetic was a contributing factor as most of the deaths occurred 10 to 15 days after the operation.

*Comment.* With the skilfull use of the anesthetics now available, the anesthetic has not contributed a grave risk and has had little or no effect on the mortality.

#### AVERAGE HOSPITAL STAY

The average time spent in the hospital for a fracture of the upper end of the femur was 55 days. Those patients treated by conservative measures averaged 73.3 days, while those treated by internal fixation remained 42.5 days. The type of fracture did not seem to influence the time to any significant degree. The time for the surgically treated group seems unnecessarily long when compared with the hospital stay of a group treated in a private institution, which averaged 15 days. This can partially be explained by the fact that expense was no item. It was "on the house" and frequently the patients' relatives were in no hurry to take them home.

#### DEATH IN DECADES

There were no deaths below the age of 40, only 1 between 40 and 50, and 5 between the ages of 50 and 60. The majority of deaths occurred between the ages of 60 and 90, and 70 per cent occurred between the ages of 70 and 90. There were 160 deaths in females and 96 in males.

#### FOLLOW-UP

It is the practice at Charity Hospital of



Louisiana to follow these patients at regular intervals in the outpatient clinics. We were quite disappointed that our follow-up group was so small, and that the majority of the patients followed were observed for less than a year. This was due to various factors such as age, disability, distance from the clinic, transportation difficulties, and lack of funds. Nevertheless, we feel that the results obtained are significant and some conclusions may be drawn from the series.

#### CONCLUSIONS

1. Intracapsular fractures when treated by operative means were followed by a higher rate of union as well as a lowered mortality. There was a 22.2 per cent higher rate of union when screws were used in preference to the Smith-Petersen nail.

2. Intertrochanteric fractures are a different problem under the age of 45, and may be treated either conservatively or by internal fixation with good results. Over 45 there is a gradual rise in the mortality, whether treated by surgical intervention or conservatively, and slightly better results are obtained with internal fixation.

3. Subtrochanteric fractures occur in a lower age group than the other types. When internal fixation is used it is accomplished by a lowered morbidity and mortality.

4. Anesthesia in the operative group did not contribute a grave risk and had little or no effect on the mortality.

5. The average number of days spent in the hospital was 73.3 for the conservatively treated group, 42.5 for those treated by surgical procedures.

6. The morbidity, mortality, and the incidence of nonunion in all types of fractures of the upper end of the femur have been reduced by internal fixation.

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## BETA IRRADIATION IN OPHTHALMOLOGY\*

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It is both necessary and appropriate, before discussing the clinical possibilities of beta irradiation in ophthalmology, to outline briefly certain fundamental considerations concerning this method of treatment.

#### BETA IRRADIATION

*Properties of Beta Rays.* Radium emanations consist of alpha, beta, and gamma rays. Alpha rays have no power of penetration, and therefore, have no therapeutic usefulness because irradiation, naturally, is without effect unless it reaches the tissues to be treated and is absorbed by them. Gamma rays, which are hard rays of high penetrating power, are used in the ordinary forms of radium and roentgen ray treatment. Beta rays, which are negatively charged electrons, can penetrate no more than 10 mm. at most and their passage can easily be stopped by appropriate screens of

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platinum, brass, lead, silver, or other metals. When these rays are used therapeutically, practically all of their effect disappears within the first 3 mm. of tissue which they traverse and 75 per cent is absorbed within the first 2 mm.

The surface absorption of beta rays, as it might be termed, makes them peculiarly suitable for the treatment of lesions of the external eye. Furthermore, since all radiotherapy is predicated on the differential sensitivity of diseased tissue, which is to be destroyed, and normal tissue, which is to be protected, the structure of the external eye and the disease processes which may occur in it make this region peculiarly suitable for this form of treatment. According to Desjardins and Williams,<sup>1</sup> tissues can be listed in the order of diminishing radiosensitivity as lymphoid cells, polymorphonuclear leukocytes, epithelium, endothelium, connective tissue, muscle, bone and nerve.

*Method of Application.* Iliff, Burnam and Neill, Ruedemann, and others with access to radon plants have employed radon in their work with beta rays and calculate the dosage in gram seconds. In the absence of these facilities we have done our work with radium and have continued, as a matter of convenience, to express our dosages in the usual terms of grams and minutes.

The intensity of irradiation varies inversely with the square of the distance of the applicator from the target, which means that a slight variation in distance can result in a large difference in the effective dosage. For this reason the spray technic (in which the applicator is moved slightly back and forth 1-3 mm. above the tissue to be treated) gives an uneven distribution over an area which itself is not clearly outlined. Hughes and Iliff<sup>2</sup>, who formerly used the spray method, have now discarded it and give all their treatments by direct contact between the lesion and the applicator.

The Burnam applicator is suitable only for the application of radon. Our own work has been done with the Iliff applicator,

which contains 50 mg. of radium and which permits contact over a surface 10 mm. long and 5 mm. wide. The monel metal, of which the applicator is constructed, is 0.1 mm. thick and the handle is 12 inches long.

Neither the Burnam nor the Iliff applicator can correctly be termed a beta ray applicator because both permit the passage of gamma as well as of beta rays. Burnam and Neill<sup>3</sup> consider the term justified, however, because gamma rays do not pass through the filter in sufficient amounts to cause injury to the deeper structures of the eye and because the effects produced have been shown to be the result of absorption of beta rays.

The applicator devised by Swanberg<sup>4</sup> for the delivery of radium "D" furnishes a treatment surface 9 mm. wide and a radioactive diameter of 5.6 mm. Theoretically, pure beta irradiation can be obtained by utilization of this agent, which is a member of the radium uranium series and is a disintegration product of radium element. Since it produces beta rays intensively but gives off only a few gamma rays, it is theoretically ideal for the treatment of lesions on the cornea, the normal thickness of which is about 1 mm. Another desirable property of radium "D," which is still available only in limited quantities, is that a relatively small amount can do the work of a much larger amount of radon and radium element. Unlike radon, which depreciates at the rate of 50 per cent every four days, radium "D" is relatively stable and depreciates at the rate of only 2.25 per cent per year, a reduction of 50 per cent thus not occurring for more than twenty-two years.

When 10 mc. of radium "D" is incorporated into the Swanberg applicator, the amount of radioactive material per square millimeter of surface area is eight times that of the full-strength radium element plaque. Moreover, the effective beta ray output is additionally increased by the fact that the treatment surface has an aluminum filter 0.05 mm. thick, the density of



which is about a sixth of that of the monel metal filter used in the Iliff applicator.

Highly successful results, according to Swanberg, were obtained by Ruedemann and others who used this applicator at the radium "D" clinic established at the City of Detroit Receiving Hospital, and only recently I have seen the excellent results obtained with it by Okrainetz at the Manhattan Eye and Ear Infirmary. Our own results with it have been extremely disappointing, though we found, as we had suspected, that the instrument which we were using was defective. These defects are now being rectified, and we look forward to securing satisfactory results with it when it is returned to us.

Beta irradiation must be applied with the utmost care from the standpoint of both patient and physician. Since the skin erythema dose of unfiltered beta rays is 18 gm. seconds, while that of gamma rays is 8 gm. seconds, adequate beta irradiation can be applied with such brief exposures that the effect of the gamma irradiation delivered simultaneously may be largely discounted. The treatment time must be determined accurately, with a stop watch, and very careful records must be kept. The duration of treatment must be strictly limited. We have not at any time exceeded ten minutes per application, nor have we ever treated a patient oftener than once a week. The applicator is handled with caution and the direct opening is applied only toward the lesion to be treated, never toward any other part of the patient's body or toward the ophthalmologist.

From the standpoint of the ophthalmologist, a daily tolerance dose of 0.1 r must not be exceeded. By a series of studies with the Geiger counter we have learned that this limit is reached in five minutes when the distance of radium from operator is 6 inches, but that, when the distance is 18 inches, exposure for ten minutes is possible before the limit of safety is reached.

While we usually limit our personnel to the treatment of one patient each day, we have found it possible to treat more than one case within twenty-four hours by the

use of a plastic contact lens, in which a window has been cut the exact size of the applicator. After the eye is anesthetized with pontocaine the lens is applied, with the window over the lesion to be treated. The applicator is then put into position and the patient can be left unattended for the duration of the treatment.

*Reactions.* No injuries of the lens, cornea or other structures seem to have been reported as the result of the absorption of gamma rays in the course of beta irradiation. The possible immediate reactions from beta irradiation are chiefly conjunctivitis with congestion, edema, and a serous or mucopurulent discharge. Later damage includes scarring, adhesions to the globe and lids, and ectropion. Damage to the iris is manifested by pain, swelling, and the formation of posterior synechiae. Corneal damage usually takes the form of ulceration, which may go on to perforation. Ruedemann<sup>5</sup> mentions "several" cases in which excessive treatment of severe corneal leukomas resulted in small perforating ulcers, for which enucleation was required.

Cataract formation is a delayed reaction, which may come on two years or more after exposure. We have seen no instance of such reaction in patients whom we have had under observation between two and three years, and expect none, because of the extreme caution with which we have used this method. Ruedemann<sup>5</sup>, and Hughes and Iliff<sup>2</sup>, have had a similar experience. That cataract formation can occur, however, is evident from our experimental studies on rabbits<sup>6</sup>, in practically all of which cataractous changes were noted, although they might have been expected, because of the large dosages deliberately used. Our own reactions have been limited to an occasional instance of hyperemia, which was always transitory, and it seems fair to say that the minimal reactions generally reported in the literature are evidence of the caution with which this method seems to have been used.

Beta irradiation apparently has no stimulating effects. In fact, as Hughes and Iliff<sup>2</sup> emphasize, all the evidence is to the

effect that regenerative processes are retarded.

#### CLINICAL USAGES

To date, beta irradiation has been employed in a wide variety of ophthalmic diseases and conditions. It has been most effective (1) in small, superficial growths, such as epithelioma, angioma, papilloma, carcinoma, lymphosarcoma, pigmented mole, melano-epithelioma and postoperative keloids; (2) in certain infections, such as scleritis, particularly of the tuberculous variety, keratitis, and resistant conjunctivitis; (3) in vernal conjunctivitis; and (4) as a preoperative and postoperative measure in keratoplasty and keratectomy. Woods and Burch<sup>7</sup> employed beta irradiation after iris inclusion operations in negroes, on the ground that the tendency of this race is to form excessive amounts of scar tissue, which would be likely to have a compromising effect on the filtering scar. Their results in a small series of cases were disappointing. Fridenwald<sup>8</sup>, however, reported excellent results when he used this method in white subjects, after corneal scleral trephine.

As Hughes and Iliff<sup>2</sup> point out, the results of treatment secured by various workers with beta irradiation are difficult to assess comparatively because of differences in dosage and technic, incomplete descriptions, varying distances of application, possible cumulative effects, and ignorance of the differential sensitivity of normal and pathologic tissue. Moreover, as they also note, there has been an unfortunate tendency to use the beta irradiation clinic as a convenient spot to which hopeless cases can be referred for treatment, often without either theoretical or practical justification.

Our own clinical experience with beta irradiation, which now covers a period of three years, has been limited to vernal conjunctivitis, certain superficial growths, occasional infections, and glaucoma, in addition to its use as a preoperative and postoperative measure.

*Vernal Conjunctivitis.* Excellent results have been reported by all workers with beta

irradiation in both the palpebral and the limbal form of vernal conjunctivitis, especially in the early cases, in which the lymphoid cells, young fibroblasts and blood vessels are all highly radiosensitive. Results are naturally less prompt in the older cases of the so-called pavement-stone type, which contain radioresistant areas of hyaline degeneration and old fibrous tissue.

Our own experience consists of about 15 cases, in which, according to the severity of the manifestations, the number of applications ranged from one to five or six, given at weekly intervals, for two to three minutes per treatment. Without exception, burning and itching were relieved promptly and in the palpebral variety it was possible to observe gross shrinkage in the size of the follicles. Beta irradiation is apparently the best treatment now available for vernal conjunctivitis. It is certainly far superior to the methods formerly employed, none of which accomplished more than transient improvement. Since this is a seasonal disease, it might be expected that treatment would have to be repeated yearly, but only 2 of the 15 patients whom we treated in 1947 or 1948 are finding it necessary to be treated again this year.

So far we have not seen any case in which it seemed necessary to employ Ruedemann's<sup>5</sup> plan of excising large and fibrotic polyps before beta irradiation was applied. For milder lesions he uses the spray method primarily. He has had particularly good results with beta irradiation in vernal conjunctivitis in childhood.

*New Growths.* The general principle of beta irradiation in new growths is to limit its primary employment to growths which are small, shallow, and superficial, and which would be difficult to excise or to treat with ordinary methods of irradiation. Beta irradiation is not a satisfactory form of treatment, at least primarily, for growths of any depth, though it may be used as a secondary measure after surgical excision.

To date we have used beta irradiation in



2 superficial carcinomas, with good results in both. We have also employed it in 7 papillomas, usually for a total of fifteen minutes in three weekly applications. All of these growths were located on the lids, the conjunctiva, or the limbus. We have used it in 6 angiomas, the cases being selected and the amount of treatment applied according to the age of the blood vessels. If the vessels were newly formed, treatment for a maximum of eight minutes gave excellent results. When the vessels were larger and older, treatment for as long as twenty to twenty-five minutes was necessary, in five minute amounts at weekly intervals. We have not attempted to use this method in the port-wine type of angioma, in which good results could scarcely be expected.

Over the past two years we have treated 25 pterygia with beta irradiation, which usually was the primary form of treatment. All of these cases were carefully selected. Small growths were treated for ten to fifteen minutes in two or three treatments. Large growths were submitted to surgery and beta irradiation was used as a post-operative measure if any tendency to recurrence was apparent. To date there has been no recurrence in any of the 40 new growths treated by beta irradiation.

*Infections.* The use of beta irradiation in infections rests upon rather uncertain grounds. The method is frequently effective, but why it should be is not clear. As Pendergrass and Hodes<sup>9</sup> have shown, the dosages have been shown to depress the defense mechanism, especially the reticulo-endothelial system. Hughes and Iliff<sup>2</sup> list as possible reasons for the good results: (1) destruction of leukocytes with liberation of proteolytic enzymes and antibodies; (2) liberation of antibodies from other sources; and (3) production of active hyperemia. The successes achieved in such chronic infectious granulomas as tuberculosis can be attributed to the radiosensitivity of epithelioid and giant cells, which are replaced by fibrous tissue, and possibly to the liberation of antibodies.

How successful beta irradiation is in anterior ocular tuberculosis is debatable. Although Woods<sup>10</sup> and Iliff<sup>11</sup> reported 72 cases, in all but 8.3 per cent of which healing or improvement occurred, and in all but 12 per cent of which vision was improved or was maintained at a stationary level, they frankly admit that the wide variation in the characteristics and ultimate prognosis of this type of ocular tuberculosis makes their statistics of doubtful worth.

We have not used beta irradiation for anterior ocular tuberculosis because we can see no rationale for its use. On the other hand, we have under observation at this time 2 patients with tuberculous episcleritis who were given beta irradiation for twelve minutes each about a year ago and both of whom have since been free from exacerbations and recurrences.

We have also treated by this method 6 cases of interstitial keratitis of syphilitic origin, with the objective of controlling the vascularity of the cornea. Routine anti-syphilitic treatment was employed at the same time. Except for this particular manifestation, we can see no justification for the treatment of ocular syphilis by beta irradiation, nor do we see the rationale of employing it for such constitutional infections as brucellosis, even when there are ocular manifestations.

*Preoperative and Postoperative Usages.* Beta irradiation has been used before and after keratoplasty and keratectomy, to prevent the development of corneal vascularization, or to control it if it has developed. We have employed it in this manner in 10 keratoplasties and in 8 keratectomies, and we find it interesting to recall that when we first began to employ these operations, some ten years ago, we used radium for this purpose, applying it by the conventional method and getting very good results.

Since a heavily vascularized cornea militates against a successful result in corneal transplantation and in keratectomy, it seems quite rational to apply beta irradiation for about twenty minutes, over a four week period, at least eight weeks before

operation, or to apply it after operation if vascularity becomes at all prominent.

The dosage of beta rays employed depends upon the degree of vascularization, and careful selection of cases is necessary. Repeated small doses, as Hughes and Iliff<sup>2</sup> emphasize, are better than single large doses, because the cells are caught in the sensitive, premitotic stage, and rapidly proliferating endothelium of capillaries growing into the cornea can thus be inhibited. This method of application, furthermore, is a protection for normal sensitive tissue. If the vessels are numerous and old, the results of beta irradiation are less good. In fact, as Hughes and Iliff<sup>2</sup> showed, the fibroblasts in such scars are sensitive to irradiation but fibrocytes are not. Furthermore, dosages of beta irradiation large enough to destroy old fibrous tissue are unlikely to have anything but a detrimental effect, in that normal stromal cells would thereby be destroyed and normal regenerative processes would be retarded. Finally, irradiation during the stage of active proliferation of fibroblasts may diminish the ultimate amount of scarring, but possibly only at the risk of perforation of the newly damaged cornea.

All of these objections are well taken. It must also be admitted that, especially in children, increasing clarity of the cornea may occur over a period of years, together with a reduction in the size and intensity of opacification, in the absence of any treatment at all. On the other hand, if the method is used carefully, our personal experience suggests that it is of value. Perhaps our results would have been equally good if we had omitted beta irradiation, but it certainly seems to have done no harm.

*Glaucoma.* Our most interesting experiences with beta irradiation have been in glaucoma, for which we have employed it with the objective of decreasing the production of intraocular fluid at the source, by destruction of the ciliary body. All other therapeutic methods, except cyclodiathermy, attempt to increase the rate of flow of

the intraocular fluid through normal drainage channels. Cyclodiathermic methods have achieved reductions of intraocular tension, but they have invariably been short-lived.

Our work in glaucoma began with a series of experimental studies on rabbits, by which we were able to demonstrate that beta irradiation could produce the desired vascular changes in the endothelium of the ciliary blood supply. Clinical testing has been carried out very cautiously, and to date we have used the method in only 9 cases, because we have not employed it in any instance in which standard methods had not been given a full trial or in which it seemed that these methods could achieve nothing. These 9 cases include:

Six cases in which glaucoma developed after cataract operations. All the patients had been treated by standard measures, including cyclodialysis, iridotaxis, or iridectomy.

One instance of untreated primary glaucoma, in which the intraocular tension was 90 (Schiotz) when the patient was first seen.

One instance of primary glaucoma, for which one eye had already been removed. Two filtration operations had been performed, without effect, on the remaining eye.

One instance of congenital buphthalmos in a child who was four years old when he was first seen, in November, 1946. Staged iridotaxis was performed, the operation on the right eye being followed by massive prolapse of the iris and ciliary body, with intraocular hemorrhage, for which enucleation was finally necessary. Tension remained high in the eye still in situ, in spite of adequate therapy, and almost in desperation beta irradiation was finally resorted to at the end of ten months. It should be noted that in this case, as in all but 2 of the other cases, the lens had already been removed and that the risk of cataract formation therefore did not exist.

One speaks of results with hesitancy when the period of observation is so short.



Every patient treated by beta irradiation has, however, shown improvement. Exclusive of the child just mentioned, who has been observed for nineteen months since the first treatment and for sixteen months since the last, the period of observation has been sixteen months in 1 case, eleven months in 4, and seven to eight months in the 3 remaining cases. In every instance there was a drop, usually marked, after the application of beta rays, and in only 2 instances did the tension ever again exceed the tension present when treatment was instituted. At the present time every patient has a lower tension than when treatment was begun, and in 2 cases in which the initial readings were 30 and 40, respectively, the latest readings are 12 to 20 (Schiotz) respectively.

As to the child with congenital glaucoma, his condition was definitely progressive before beta irradiation, but it has not progressed since, and there has been no further loss of the (very limited) vision he possessed when he was first seen. Moreover, the consistently lower intraocular tension suggests that the disease process, the natural tendency of which is progressive, has become at least stationary if it has not actually regressed. The relatively long duration of the improvement—now nineteen months—is the most hopeful feature of the case and is in contrast to the disappointingly brief decreases in intraocular tension reported by Troncoso<sup>12</sup> as the result of diathermic therapy.

#### SUMMARY AND CONCLUSIONS

Beta irradiation has now been established as a satisfactory method of treatment for certain diseases and conditions affecting the internal eye, including vernal conjunctivitis, superficial new growths, and certain infections. It is useful as a preoperative and postoperative measure in keratoplasty and keratectomy. Finally, it seems to offer some promise in glaucoma, by reducing intraocular pressure through control of aqueous production at its source in the ciliary body. The background of beta irradiation has been briefly outlined, methods of ap-

plication have been discussed, with emphasis on the precautions necessary, and the results secured in a personal experience with the conditions mentioned have been reported.

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#### DISCUSSION

Dr. Wm. B. Clark (New Orleans): Dr. Haik is to be congratulated on his excellent presentation of a very timely subject. There seems to be much confusion and misapprehension about the use of this excellent source of potent radiant energy and its aid in treating lesions around the anterior segment of the eye. I am sure that one who reads Dr. Haik's paper carefully will see that most of these misconceptions are not justified. Sufficient experimental work, supplemented by clinical experience, has been done to prove that the use of beta irradiation in ophthalmology is a safe procedure if used in the manner recommended by those who have had the most experience with it.

My own experience with its use dates back to the purchase of the so-called Iliff beta radium applicator by the New Orleans Eye, Ear, Nose and Throat Hospital on April 2, 1947. This instrument is available on a rental basis to all ophthalmologists who wish to use it. Since that time we have treated 64 eyes with the applicator with very gratifying results in most cases, and disappointments in others.

When the Swanberg applicator, mentioned by Dr. Haik, containing 10 millicuries of radium-D became available in January, 1948, we purchased one of these applicators at the Smith-Clark Eye Clinic. Unlike Dr. Haik, however, our results with this

instrument were very satisfactory. There is only one objection: In order to get the sufficient amount of dosage from the instrument it is sometimes necessary to hold the applicator in contact with a lesion for as long as ten to fifteen minutes. This, of course, is very tiring to both the patient and the operator. Several mechanical devices have been designed to hold the applicator in contact with a lesion on the anterior segment of the eye. In my experience, none of these are satisfactory for some patients are unable to hold their eye in one position of gaze and the applicator is displaced from its proper position in contact with the lesion. There is nothing, so far as I know, that will serve as a substitute for standing by the patient with the applicator held manually in contact with the lesion.

In order to overcome this objection to the original Swanberg radium-D applicator, we now have on order one of the more recent models as designed by Dr. A. D. Ruedemann of Wayne University. This applicator is of similar design but contains twice as much, that is, 20 millicuries, of radium-D. This applicator is made by painting the radium-D on a small sheet of monel metal, in successive layers. Each layer is allowed to dry before the next is placed on. With this layered arrangement some of the beta rays from the deeper layers are absorbed by the superficial layers. It has been estimated that the loss in efficiency varies from 10 to 25 per cent. Thus, it is obvious that with the 20 millicurie applicator one will not get twice the effect as with the 10 millicurie applicator. Therefore, in figuring the dose of the larger applicator, this must be taken into consideration.

In our opinion the Swanberg radium applicator has a distinct advantage in that the patient and the operator are not exposed to gamma radiation. Thus, a series of one or more patients can be treated in one day without danger to the operator.

Our clinical results have been most satisfactory in the following conditions: (1) Vernal conjunctivitis, both the limbal and palpebral types; (2) recent corneal scars; (3) superficial early corneal vascularization; (4) episcleritis; and (5) regeneration of blood vessels in the cornea where keratoplasties have been done.

While one does not have the opportunity to treat large numbers of cases of tuberculous anterior uveitis, it was our good fortune to have a patient who was one of the series reported by Dr. Alan Woods of Johns Hopkins Hospital and referred to by Dr. Haik. The results in this case were so spectacular that I have used beta irradiation in 2 of my own cases. These results were equally gratifying.

Our results in destroying large interstitial vessels in the cornea have been rather disappointing. Of course this can be understood when one realizes how beta irradiation influences tissue, as Dr. Haik has so ably explained.

Our most spectacular results have been in cases of early corneal scars. However, a word of caution should be expressed here about the use of this form of therapy in the treatment of corneal lesions such as chemical burns in which one half or more of the corneal stroma has been damaged. I recall one case in particular of a rather severe lime burn with early pannus, which was seen late. This was treated with possibly a little too much enthusiasm, and while we ended up with a fairly clear cornea, the remaining stroma was so thin the patient developed a keratoconus. This will ultimately have to be repaired with a perforating keratoplasty, a procedure which could probably have been done more successfully in an opaque cornea rather than in a conical cornea.

Our experience with the use of beta irradiation in glaucoma has been limited to a small series of cases of aphakic glaucomas in which our results have been disappointing.

Dr. Green: I may be presumptuous in saying this, but speaking from a radiologist's standpoint, I want to again caution you about using radium. By that, I don't want you to quit using radium, I think it is a very valuable therapeutic agent. I hope that you realize the dangers of using radium with your bare hands, in any type of applicator that is not thick enough to keep out all of the radiations that may be thrown to you or to your hands. It is pretty tragic for a surgeon, as a surgeon, if he loses a finger, but handling large amounts of radium with the bare hands is dangerous and should not be used every day. I know that the applicator is away from your hands, but you are going to find that you are going to get body exposure, and your hands are closer to it, and you get more exposure to your hands and for a longer period of time.

Any type of radiation, whether alpha, beta or gamma can be injurious to the hands; and when they are once injured, the action is not reversible. As you become older, the hands are more abused, and there is greater possibility of tumor from the radium.

I just want to make that warning, but I hope it is not a warning that will discourage anyone from the use of the beta irradiation in treatment of the eye.

Dr. Louis A. Breffleilh (New Orleans): Although much has been written concerning the use of radium or radon in ophthalmology, very little has been published concerning the danger to the operator and patient. What is the tissue reaction? What is the best dosage and what dosage may be tolerated by the operator are a few unanswered questions.

Much has been written on the rabbit experiments in which lens changes were not present but most of this work was conducted with radon in heavy dosages and not with the applicators now on the market. Our first experiments revealed that over



thirty minutes dosage in rabbits produced lenticular changes. The applicator used contained 50 mg. of radium and is the one on the market.

Fortunately, none of the humans examined and treated have revealed any evidence of lenticular changes. We will continue our cautious study for these changes.

The next problem is the safety of the operator. This problem concerns us as doctors and I fear if we wait for the producers of the radium, then a satisfactory answer will not be obtained. A minometer indicator was used to determine the safe dosage and the work was performed at the New Orleans Charity Hospital. At first the indicator was attached to the wrist of the operator and another at his belt. The applicator was held on the tip of its handle and after twenty minutes the wrist indicator revealed the dosage unsafe, while thirty minutes was needed for the belt indicator to pass the safety exposure. Since the dosage is inversely proportional to the distance the experiment was then conducted with the indicator held first 6 inches from the tip alongside the handle. The indicator revealed the safe dosage was under five minutes. At the distance of 18 inches, the indicator revealed safe dosage under ten minutes.

It is almost impossible for the operator to hold the applicator in place for five minutes at the tip of the handle, consequently the elbow is usually rested near the patient within the 6 inch distance. From the above study it was necessary to devise a method of holding the radium in place if more than one patient is to be treated a day, thus the contact lens holder was devised.

Dr. Haik (In conclusion): I would like to thank Dr. Clark, Dr. Green and Dr. Breffeilh for their

discussion of this paper. I had asked Dr. Green if he would not discuss the dangers in the use of radium in ophthalmology. I thought it was important for us to know the dangers and how we could protect ourselves. We get very little information out of the literature and very little from experimental reports on the care of the individual handling the radium.

Dr. Clark mentions the use of beta irradiation in intraocular tuberculosis and in our paper I refer to the work of Woods and Iliff and their results.

Dr. Green: When you have this applicator in your office, the company from which you buy it, do they send you a way to store it so that you are not exposed to it?

Dr. Haik: We have a three-inch lead compartment in which to keep our radium and this is the one recommended by the American Radium Society. It is kept in a separate room and there is little or no exposure to anyone in the office.

Dr. F. E. Le Jeune (New Orleans): We were concerned in the use of radium in otorhinolaryngology, and were told by the company from which we obtained the applicator that the three inch lead was not sufficient to protect those who came in contact or entered the room where this radium was stored. Eventually we were made to get a six-inch lead container. That is what we are using at the present time. We only use the three-inch one to transport the applicator to the hospital or the various rooms; otherwise it is kept at all times in the six-inch lead container.

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## SURVEY OF PHYSICIANS' INCOMES

In fighting the battle against State Medicine and in improving the political relations of organized medicine, knowledge of physicians' incomes has become of great importance. We need to know just what the public pays doctors.

Surveys of physicians' incomes have been conducted in the past, and one as recent as 1941. Investigators in this field consider that in the past ten years changes have occurred, and they also have reason to believe the averages in the past have been too high. It is felt that this error came into the figures for the simple reason that those physicians who did not have bookkeepers could not find figures readily available and

did not fill out the questionnaires sent them. Accordingly, it is urged that every physician who receives a questionnaire complete it, no matter how small the income. It is only by this means that a representative amount of data can be compiled. With this data, a complete picture can be presented to the public.

Within the next month, the Bureau of Medical Economic Research of the American Medical Association, and the Office of Business Economics of the U. S. Department of Commerce will jointly conduct the survey. The A.M.A. participation has been authorized by the A.M.A. Board of Trustees. The results of the survey will be published by the Department of Commerce next fall in its monthly publication, "Survey of Current Business." Surveys of incomes of dentists and lawyers have already been made jointly with the American Dental Association and the American Bar Association, within the past year. The analyses were published in August 1949, and in January 1950, respectively.

The physician is assured that the survey has no relation whatever to the operations of the U. S. Bureau of Internal Revenue. It is stated that there is no way by which the Department of Commerce could have obtained the needed information from the Bureau of Internal Revenue. Considering the way that various Government bureaus and departments fight among themselves, this is quite easy to believe. By the participation of organized medicine in the survey we have added assurance of its correct interpretation.

The procedure to be followed is one which will assure complete impartiality. The Bureau of Medical Economic Research of the A.M.A. has files of about 200,000 physicians. The survey will cover 125,000 or 62½ per cent of the total. There will be a short form for income data for the year 1949 only. There will be a long form questionnaire for the years 1945 through 1949. All are to be returned unsigned in franked envelopes. The short form will be sent once only to every other name in the file. Of the remaining 100,000 names, every



fourth will be selected. Those who comprise this fourth will receive 10,000 short forms and 15,000 long forms. These 25,000, who may receive either the short or the long forms, are requested to return the forms in a franked envelope which will carry a code number. This code number will identify the physician to the Bureau of Medical Economic Research. It does not appear on the questionnaire and will not identify it in any respect. The only purpose of the code number is to enable the Bureau of Medical Economic Research to address a follow-up letter to those not replying to the first request.

Physicians will be doing the medical profession a service by filling out the forms

and returning them just as soon as they receive them.

Statistics which will be accumulated in a complete survey, such as we hope this will be, will give factual support to an observation which is all too well understood within the profession and too little appreciated outside of it. Considering the length and expense of preparation, the hours of work, and the limited years of productivity, the average physician is underpaid. This survey will also show more conclusively than those in the past that the major expense in illness is not physicians' services.

Each physician, therefore, who receives a questionnaire is urged to fill it out completely and promptly.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

*An informed profession should be a wise one.*



DR. EDWIN HUGH LAWSON

As the Seventieth Annual Meeting of the Louisiana State Medical Society comes to an end this year, Dr. Hugh Lawson will

conclude his term of office as President. The State Society pays tribute to his direction of the executive office during this year. Owing to the fact that problems have been numerous and complex, the year has been an arduous one. Matters of scientific moment have claimed the attention of the President and of the Executive Committee more this year than in others past. In addition, the threat of State Medicine and the impact of the agitation to destroy private practice made it necessary for the President to direct the organization's activities to combat these influences.

Dr. Lawson has served the Society's interests exceedingly well, and we can count ourselves fortunate that in times as troublesome as these we have had such splendid leadership. It is, however, by no chance circumstance that Dr. Lawson was able to guide the affairs of the Society and serve so admirably its aims and purposes.

Dr. Lawson was born in Indianapolis, Indiana, on May 13, 1889, the son of the Reverend M. M. Lawson and Katherine Darrah.

He attended grammar and high school in Nashville, Tennessee, and the University of Arkansas at Fayetteville from 1916 to 1920, graduating with a Bachelor of Science in Chemistry. He entered Tulane University Medical School in 1920, and was graduated in 1924, with the degree of Doctor in Medicine. This began a long period of association with Tulane University, during which time he was part-time instructor in the Department of Chemistry, 1920 to 1921. He was instructor in Physiology in 1926 to 1927; instructor in Bacteriology and Pathology, 1927 to 1936; and Assistant Professor of Clinical Medicine, 1936 to 1942. In the latter year, he was made Professor of Clinical Medicine, which appointment he still holds. In the many years during which he has served as teacher and professor in Tulane University, he has contributed greatly by example and inspiration to the teaching and direction of medical students, many of whom are members of our Society, and those of neighboring States.

Within the field of practice Dr. Lawson has had long and careful training in the field of pathology, and has become an eminent authority. His training began as an extern in Pathology at Touro Infirmary in 1923 and 1924. The following year he was a graduate assistant in Pathology there. In 1925 and 1926 he served a general internship at Touro, and since 1926 has been Director of Pathology at the Baptist Hospital in New Orleans. He was Director of Pathology in the Sara Mayo Hospital, 1940 to 1950. He is consultant in Pathology at the U. S. Marine Hospital since 1940.

Organized medicine owes a debt of gratitude to Dr. Lawson for his many years of service. He was Treasurer of the Orleans Parish Medical Society, 1937 to 1941, and President of the Society 1941 to 1942. He was the first President of the Louisiana Association of Pathologists in 1940-1941.

He was Treasurer of the New Orleans Graduate Medical Assembly, 1946-1948, and President-Elect of the New Orleans Graduate Medical Assembly at the present time. He is on the Executive Committee of the American Society of Clinical Pathologists. He is Councillor of the State of Louisiana to the Southern Medical Association. He is a member of many units of organized medicine, including the Orleans Parish Medical Society, the Louisiana State Medical Society, the American Medical Association, the Louisiana Association of Pathologists, the Southern Medical Association, the American Society of Clinical Pathologists, the American Association of Pathologists and Bacteriologists, the American Biological Photographic Association, and the American Chemical Society. He is a founding member of the College of American Pathologists, and a diplomate of the American Board of Pathology since 1936.

Dr. Lawson is a veteran of two wars, having been a second lieutenant in Infantry in 1918, in World War I, and a lieutenant commander in the U. S. Navy in World War II.

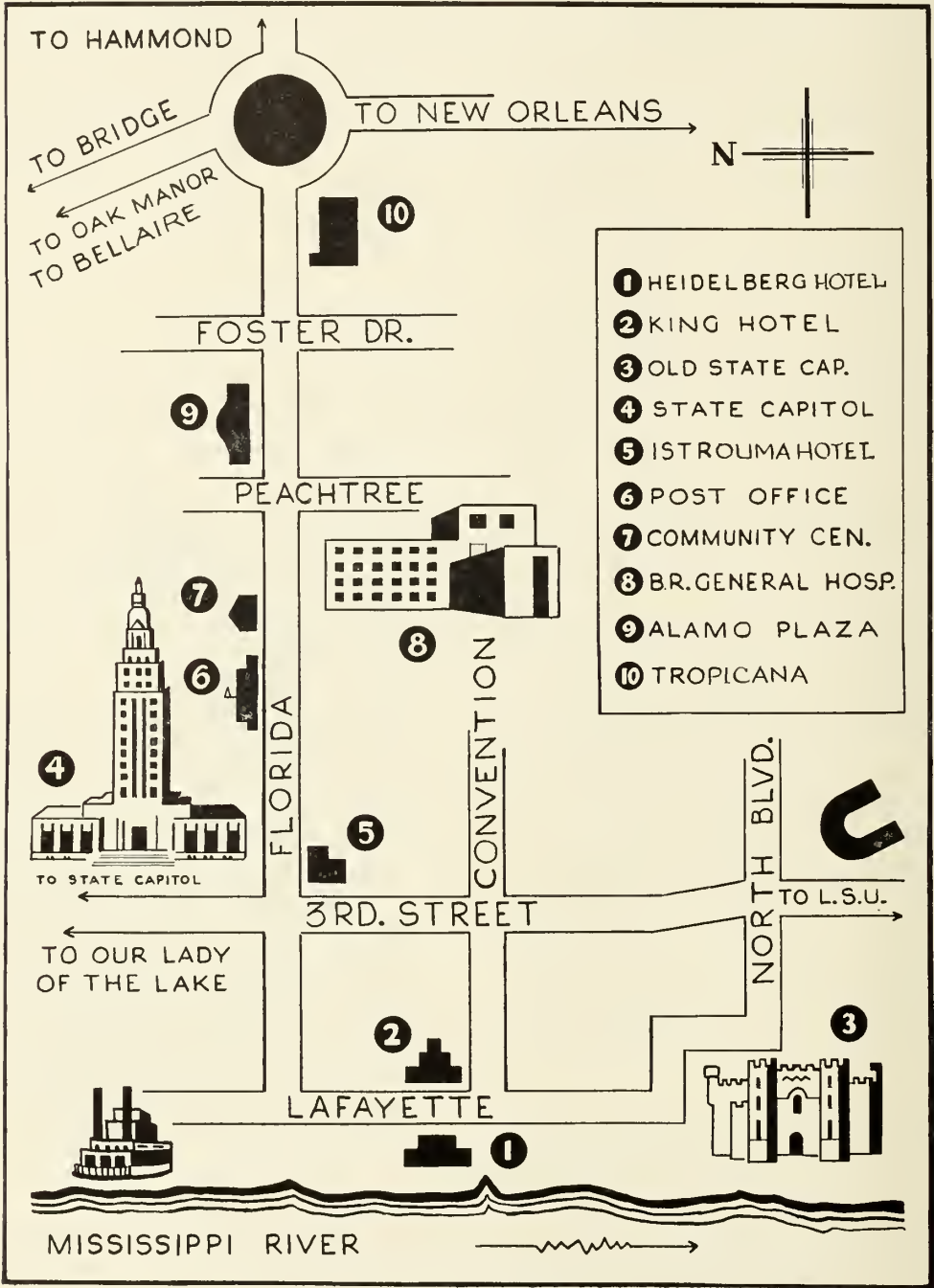
In spite of these time consuming activities, Dr. Lawson had had opportunity for social interests, which include membership in the Sigma Alpha Epsilon fraternity, the Phi Chi medical fraternity, the Army and Navy Club, and the New Orleans Country Club.

The Society appreciates Dr. Lawson's conscientious efforts in behalf of the general welfare. All are happy to remember that even though he leaves the office of President he will be available for conference and consultation to assist in many phases of the Society's efforts to improve medicine as a whole, and to combat the efforts of Communists to establish state medicine. The best wishes of the Society go with Dr. Lawson.



SCHEMATIC DIRECTIONAL GUIDE OF BATON ROUGE  
ANNUAL MEETING

Complete program for the 1950 meeting of the State Society, to be held in Baton Rouge, April 24-26, will be sent to each member of the Society two weeks prior to the meeting. This will include all data concerning opening session on Monday evening, scientific sessions on Tuesday and Wednesday and meetings of the House of Delegates. A large attendance is expected at this meeting and it is felt that a review of the program will make every member interested in making plans to attend.



## LOUISIANA STATE MEDICAL SOCIETY NEWS

## C A L E N D A R

## PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

## INVITATION TO VISIT HAWAII

The Hawaii Territorial Medical Association and the Honolulu Medical Society invite visitors to the AMA convention in San Francisco to take a post-convention trip to Hawaii. They report to have arranged excellent facilities for an extension of the benefits and pleasures of the San Francisco convention and also recreational and entertainment features. The Committee on Arrangements report that the tour to Hawaii could be regarded as part of the convention under the plan suggested by the Honolulu County Medical Society to set up one evening or a half day for a clinical discussion or symposium in Honolulu on a medical subject of vital and wide interest, thus, making Hawaii visit an integral part of the San Francisco convention.

The Committee further reports that the Hawaii trip, moreover, would serve as a splendid vacation to cap the convention for the delegates and their families and suggests that a "commuter's trip" be taken due to Hawaii's proximity to the west coast—only nine hours by luxurious airliner on several daily flights, and for those with a little more time, four and one-half days by cruise ship.

Although Hawaii is famous as a year round playground, it is the summer that is truly the splendid season. There are swimming and surfing, deep sea fishing, golfing on any of 14 excellent courses on all the islands, unique sightseeing trips, or, just loafing.

#### DELEGATIONS FROM OUR TWO MEDICAL SCHOOLS GUESTS OF ELI LILLY AND COMPANY

On February 19, 20, 21, delegations from the L. S. U. Medical School and Tulane University School of Medicine, were guests of Eli Lilly and Company in Indianapolis. During their visit, they made a thorough inspection of the Laboratories including the Research Laboratories, replica of the original laboratories, and the Biological Laboratories at Greenfield, Indiana, where demonstrations were made showing the production of biological products.

#### CONFERENCE ON FUNDAMENTAL CANCER RESEARCH

Meetings of interest to scientists and physicians will be held at the Texas Medical Center, Houston, Texas, May 12-13. Featured speakers will be Dr. A. C. Broders of the Mayo Clinic, Dr. Marshall Burcer of the Oak Ridge Institute of Nuclear Studies and Dr. C. P. Rhoads of the Memorial Hospital, New York City. The meetings include:

(1) the fourth annual SYMPOSIUM ON FUNDAMENTAL CANCER RESEARCH, of The University of Texas, M. D. Anderson Hospital for Cancer Research, during which one-half day will be devoted to selected papers on the subject of isotopes in cancer research;

(2) a CANCER PATHOLOGY CONFERENCE of The University of Texas Postgraduate School of Medicine, on "Tumors of Muscle Origin";

(3) a SOUTH CENTRAL REGIONAL MEETING OF THE COLLEGE OF AMERICAN PATHOLOGISTS, with co-participation in the symposium and pathology conference.

Dr. C. P. Rhoads will be the banquet speaker on the evening of May 12. Further information may be obtained from William O. Russell, M. D., 2310 Baldwin Street, Houston, Texas.

#### COMING MEDICAL MEETING

The International Post-Graduate Medical Assembly of Southwest Texas will hold their annual meeting in San Antonio, Texas, at the Municipal Auditorium, January 23, 24, 25, 1951. Dr. Merton M. Minter, President; Dr. John J. Hinchey, Treasurer.

#### POST-CLINICAL TOUR OF THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

A group of about 30 American physicians, many of whom were accompanied by their wives, making up a total of about 50 persons, arrived in Kingston, Jamaica, March 18, on a specially-chartered Pan American Airways clipper, for a four-day visit, during which they inspected hospitals and clinics and observed public health methods. They left Miami on March 11.

The stop at Jamaica was part of a two-weeks'



program which included brief calls at Puerto Rico, the Virgin Islands, and the Dominican Republic. The last stop before returning to the U. S. A. was a three-day visit in Havana.

Their aerial tour was a post-clinical feature of the New Orleans Graduate Medical Assembly, which is a gathering of practicing physicians for brief refresher courses, sponsored by about 100 New Orleans doctors. Medical men from over 35 states attended the 1950 sessions.

The doctors were specially interested in the George V Hospital, largest tuberculosis institution in the West Indies, and in the various public health and hygiene developments that have been inaugurated over a term of years with the cooperation of the Rockefeller Foundation.

Among the physicians and others arriving were Dr. and Mrs. Edmund G. Vinje of Hazen, N. D., Dr. and Mrs. Carl J. Baumgartner of Bismarck, N. D., Dr. and Mrs. Carroll Lund of Williston, N. D., Dr. and Mrs. Edward K. Chunn of Houston, Tex., Dr. and Mrs. Russell F. Weyher of Detroit, Mich., Dr. and Mrs. James A. Tesson, Dr. and Mrs. Fred Irwig and Dr. and Mrs. Edward H. Thiessen, all of Kansas City, Mo., Dr. J. Hutchings White and Dr. M. K. Thompson of Muskogee, Okla., Dr. and Mrs. Carl Granberry, Dr. Curtis Tyrone, Dr. Robert A. Robinson and Mrs. Irma B. Sherwood, all of New Orleans, Dr. and Mrs. W. Terrell Simpson and Miss Betty Ann Simpson of Winter Haven, Fla., Dr. and Mrs. Edgar H. Greene of Atlanta, Ga., Dr. and Mrs. J. Franklin Gorrell of Tulsa, Okla., Dr. and Mrs. William J. Wilson of Ogden, Utah, Dr. and Mrs. James Williams of Jacksonville, Fla., and Dr. G. S. Walker and Dr. R. S. Hollingsworth of Clinton, Mo.

#### SOUTHEASTERN SURGICAL CONFERENCE

Dr. Lucien A. LeDoux, Past President and Trustee of the Southern Medical Association, delivered the Annual C. Jeff Miller Memorial Medical Lecture before the Southeastern Surgical Congress at its meeting in Washington, D. C. Dr. LeDoux chose as his subject: "C. Jeff Miller, His Teachings in the Management of Uterine Fibroids."

#### NEW ORLEANS MEDICAL AND SURGICAL JOURNAL BACK ISSUES AVAILABLE

1929—January through December  
 1930—January through December  
 1931—January through June  
 1934—January through December  
 1935—May through December  
 1936—January through September  
 1937—Few copies  
 1938—January through December  
 1939—January through December  
 1940—January through December  
 1941—January through December  
 1942—January through December

1943—January through December

1944—January through December

1945—January through December

1946—Few copies

1947—January through August—November through December

1948—January through February—September through December

#### INFORMATION CONCERNING IMMUNIZATIONS FOR OVERSEAS TRAVEL

The State Department of Health frequently receives requests for immunizing for travel abroad, and has issued the following summary from the bulletin prepared by the office of International Health.

Information as to which immunizations are required for travel to any particular country may be obtained from the Passport Division of the Department of State which will mail a blank international certificate of inoculation and vaccination.

The local physician can do any of the immunizations except for Yellow Fever immunizations which, because of the great difficulty of maintaining a potent vaccine, are given only at the port of embarkation or at a U. S. Marine Hospital.

**Smallpox:** Recommended before travel to any foreign country. Vaccinate at least 14 days before leaving the United States. Observe and record the reaction on the 3rd and 9th days. The certificate of smallpox vaccination is valid for three years. If Yellow Fever inoculations are to be given too, they should be given at least 5 days before the smallpox vaccine is given.

**Yellow Fever:** Give at least 10 days before leaving the country. One injection is required. Certificate becomes valid on the 10th day following vaccination and remains so for 4 years. Rather than spending 10 days or more at the port of embarkation many would prefer to go to their nearest U. S. Marine Hospital for the inoculation. (See the accompanying list for these hospitals).

**Cholera:** Start immunizations at least 2 to 3 weeks before leaving the United States. The standard course is 2 injections at 7 to 10 day intervals. A third injection is advisable. The International Cholera Certificate is valid for 6 months from the date of last vaccination. It can be kept in force with booster injections.

**Typhus:** Begin inoculation 2-3 weeks before leaving the country. Standard course is 2 doses at a 7 to 10 day interval. While the certificate is valid for 1 year, a booster dose is recommended at 6 months if the danger of typhus is still present.

**Typhoid and Paratyphoid:** Should be taken by every person traveling abroad. Standard course is three inoculations at 7 to 10 day intervals. Annual boosters should be taken.

**Diphtheria:** Children under 15 who go abroad should be immunized against diphtheria. For travel in some areas of high diphtheria incident,

adults up to the age of 35 should be immunized if their Shick tests are negative.

*Note:* Individuals receiving the required immunizations should bring or send their certificates to the State Dept. of Health for certification, as foreign agencies usually like the seal of a governmental agency on said certificates.

Stations of the Public Health Service  
Administering Yellow Fever Vaccine:

New York City, U. S. Public Health Service Dispensary, 67 Hudson Street, Barclay 7-6150.

Baltimore, Md., U. S. Marine Hospital, Wyman Park Dr. and 31st St., University 3930:

Washington, D. C., U. S. Public Health Service Dispensary, Federal Security Bldg., So., 4th and D. Streets, S. W., Executive 6300.

Miami, Florida, (1) U. S. Quarantine Station, Fishers Island, (2) U. S. Public Health Service, Relief Station, 365 Federal Building, 5-1959.

New Orleans, La., U. S. Marine Hospital, 210 State Street, Uptown 8700.

Brownsville, Tex., U. S. Quarantine Station, U.

S. Border Service Building, International Bridge and 14th Street.

Chicago, Ill., U. S. Marine Hospital, 4141 Clarendon Avenue, Lake View 6340.

Los Angeles, Calif., U. S. Public Health Service, Relief Station, 406 Federal Building.

San Francisco, California, U. S. Marine Hospital, 14th Avenue and Park Blvd., Bayview 0259, 0260, 0261, 0262, 0263, 0264, 0265.

Hamilton, Mont., Rocky Mountain Laboratory, South 4th Street, Call Hamilton and ask for Laboratory.

Cleveland, Ohio, U. S. Marine Hospital, Fairhill Rd. and East 124th St., Garfield 2260.

Savannah, Ga., U. S. Marine Hospital, York and Abercorn Sts., 7714, 2-9161, 2-0162.

Fort Worth, Tex., U. S. Public Health Service Hospital, Fort Worth 5-2104, 5-2105, 5-2106.

Detroit, Michigan, U. S. Marine Hospital, Windmill Pointe, Valley 29300.

Boston, Mass., U. S. Marine Hospital, 77 Warren Street, Stadium 23400.

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## WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

The annual open meeting of the Woman's Auxiliary to the Shreveport Medical Society was held February 8. Dr. W. W. Bolton, Associate Director of the Public Health Division of the American Medical Association spoke on "Recent Medical Advances". The speaker was introduced by Dr. J. H. Eddy, Vice-president of the Shreveport Medical Society.

The Auxiliary had invited members of all the woman's clubs in the city to be their guests in order that they might hear Dr. Bolton. Following his address, the Auxiliary entertained their guests at tea.

In holding this meeting, the Shreveport Auxiliary has once again made a real contribution in the field of public relations. Their Speaker's Bureau which was organized last year to bring to club women of Shreveport facts pertaining to socialized medicine, was recognized throughout the state as having been a most commendable project.

The February meeting of the Ouachita Parish Auxiliary followed a luncheon at a local restaurant. The highlight of the meeting was a review by Mrs. James Shonlau on the "Biography of Harvey Cushing".

Mrs. Ray B. Theaux was the guest speaker at the February meeting of the Lafayette Parish Auxiliary. She gave a talk and demonstration on the making of aluminum trays and coasters. She explained where and how materials would be available for those members who cared to make trays.

A committee to make plans for Doctor's Day was appointed. It consists of: Mrs. Edgar Breaux, Mrs. J. J. Burdin, Mrs. Ralph Bourgeois and Mrs. Lee Sonnier.

The Orleans Auxiliary was hostess to the wives

of doctors attending the New Orleans Graduate Medical Assembly. The ladies were entertained at a fashion show and tea which was held in conjunction with the regular monthly meeting.

Newspaper editorials and a radio program have been planned for the observance of Doctor's Day. The Orleans Auxiliary has made its usual donation of \$25.00 to the Commemoration Fund in honor of the doctors. This fund is used for the care of indigent widows of doctors.

April has been designated as "Membership Month". At this meeting members who have not attended meetings for some time will be brought "back into the fold". New members will be specially sponsored by members of the board to create good fellowship and welcome them into the group.

Plans for Doctor's Day, March 30, were discussed at the regular meeting of the Woman's Auxiliary to the Calcasieu Parish Medical Society.

The Jefferson Davis Parish Auxiliary had a book review by Mrs. L. E. Shirley. She reviewed the book "Mystery, Magic and Medicine" by Howard W. Hagard, Associate Professor of Applied Physiology at Yale University. The book deals with the rise of medicine from superstition to science.

Plans are being made by Jefferson Davis Auxiliary to honor their doctors at a banquet in celebration of Doctor's Day.

In Rapides Parish, the doctors will be honored at a coffee party given jointly by the Auxiliary and Baptist Hospital. Each doctor will be presented with a red carnation boutonniere.

Mrs. Daniel M. Kingsley  
Chairman  
Press and Publicity



Woman's Auxiliary  
Louisiana State Medical Society  
Annual Meeting  
April 24-26, 1950—Heidelberg Hotel

Monday, April 24, 1950

Registration ..... 9:00 A. M.  
Mezzanine Floor, Heidelberg Hotel  
Pre-Convention Executive Board Meeting ..... 10:00 A. M.  
Conference Room, Louisiana National Bank Building, Mrs. John S. Dunn, Presiding  
Invocation  
Reverend Philip Werlein  
Appointment of Special Committees  
Auditing  
Finance  
Resolutions

Luncheon—Baton Rouge Country Club 1:00 P. M.

General Meeting—First Session—  
Baton Rouge Country Club ..... 2:00 P. M.  
Invocation  
Reverend Charles J. Murphy  
Address of Welcome  
Mrs. Wiley A. Dial  
Response  
Mrs. L. L. Davidge, Shreveport, Louisiana  
Reading of Minutes of last General Session  
Reports of Parish Presidents  
Report of Woman's Auxiliary to the American Medical Association  
Mrs. Nathan Polmer, New Orleans, Louisiana  
Report of Woman's Auxiliary to the Southern Medical Association  
Mrs. Allen C. Winters, Alexandria, Louisiana  
Reports of State Committees  
Archives  
Bulletin  
Cancer  
Commemoration Fund  
Doctor's Day  
Historian  
Hygeia  
Organization  
Preservation of Medical-Cultural Items  
Press and Publicity  
Printing  
Revision of By-Laws  
Rural Health  
Year Book  
Adjournment

Official Opening Meeting of the Louisiana State Medical Society, Public  
Invited ..... 8:00 P. M.  
Heidelberg Hotel Roof

Tuesday, April 25, 1950

General Meeting—Second Session—  
Jefferson Country Club, Mrs. John S. Dunn, Presiding ..... 9:00 A. M.  
The Lord's Prayer  
In Memoriam  
Mrs. William Kohlmann  
Benediction  
Rabbi Walter G. Peiser  
Greetings from Honored Guests  
Dr. Edwin H. Lawson, President, Louisiana State Medical Society  
Dr. George Wright, President-Elect, Louisiana State Medical Society  
Dr. Daniel J. Fourrier, President, East Baton Rouge Parish Medical Society  
Dr. Paul T. Talbot, Secretary, Louisiana State Medical Society  
Dr. U. S. Hargrove, Convention Chairman  
Mrs. David B. Allman, President, Woman's Auxiliary American Medical Association  
Mrs. Arthur A. Herold, President-Elect, Woman's Auxiliary American Medical Association  
Mrs. Robert C. Haynes, President, Woman's Auxiliary American Medical Association  
Reports of State Committees (continued)  
Editor, News and Views  
Finance  
Legislation  
Program  
Public Relations  
Reports of State Officers  
President-Elect  
Vice-Presidents  
Treasurer  
Recording and Corresponding Secretaries  
Parliamentarian  
Chairman of District Councilors  
President  
Reports of Special Committees  
Auditing  
Finance  
Registration  
Unfinished Business  
Recommendations of Executive Board  
New Business  
Report of Nominating Committee  
Election of Officers  
Introduction and Installation of New Officers  
Announcements of incoming President  
Report of Resolutions Chairman  
Adjournment

Luncheon—Jefferson Country Club..... 1:30 P. M.  
 Tea or Reception (to be announced later)  
 .....5:00-7:30 P. M.  
 President's Dance ..... 8:00 P. M.  
 Wednesday, April 26, 1950

Post-Convention Board Meeting and  
 School of Instruction ..... 9:00 A. M.  
 Conference Room, Louisiana National Bank  
 Building  
 Mrs. DeWitt T. Milam, Presiding

## BOOK REVIEWS

*Handbooks of Diseases of the Skin:* By Richard L. Sutton, M. D. and Richard L. Sutton, Jr., M. D. St. Louis, C. V. Mosby, 1949. Pp. 749, Illus. Price, \$12.50.

The "Handbook," a new volume in the various texts on dermatology authored by the Suttons, is more complete than the "Synopsis" and less voluminous than the fourth edition of "Introduction to Dermatology". It seems to be primarily intended as a text for medical students but will be found useful by practitioners in dermatology.

It is particularly commendable that in this volume the authors have changed the order of presentation. Diseases are classified by their etiological factors and presented in this grouping. This leaves the chapter on "Dermatitides of Unknown Cause," to include such familiar conditions as atopic dermatitis, pityriasis rosea, lichen planus, psoriasis, and lupus erythematosus, but this chapter should shrink in size in view of rapid development in all fields of medicine.

The chapters on contact dermatitis is especially well done and the section on the treatment of syphilis is as up to date as the time of publication would permit.

Illustrations are well selected, many of them new, but some carried over from earlier volumes.

This book should be well accepted.

M. T. VAN STUDDIFORD, M. D.

*Pathology and Surgery of Thyroid Disease:* By Joseph L. DeCourcy, M. D. and Cornelius B. DeCourcy, M. D. Springfield, Ill. Chas. C. Thomas, 1949. Pp. 476, pl. illus. Price, \$10.00.

This treatise on various aspects of the thyroid gland is based on the clinical experience of the authors, and the extensive literature on thyroid disease.

The first chapter briefly surveys the authors'

impressions on various aspects of hyperthyroidism and hypothyroidism, and of the morphologic changes affecting the thyroid in which no disturbance of function is encountered. Ensuing chapters deal with historical contributions made in thyroid disease; the embryology and the anatomy, histology, and cytology of the thyroid gland. Detailed surveys of the physiological contributions and pharmacological therapeutic agents are next presented.

The pathology of the thyroid gland is presented and illustrated. The authors next present their views regarding the causation of signs and symptoms in exophthalmic goiter, (diffuse toxic goiter). They feel the "most likely explanation for the pathogenesis of exophthalmic goiter is that the condition is dependent on a disturbance of the sympathetic nervous system, influenced by various sympathomimetic agents, such as infection, psychic upset, and some obscure thyrogenic factor." Their explanation of the causation of exophthalmos, tachycardia, and the rise in BMR, is quite at variance with other authorities on these topics.

Other chapters discuss thyroid disease in the aged, preoperative considerations, anesthesia in thyroid surgery, and mention the initial contributions being made with radioactive iodine.

In some sections the book is needlessly repetitious. Too often unsubstantiated impressions of the authors are presented as facts without discussion of contrary opinions. For example, "The only truly benign tumor of the thyroid is fetal adenoma . . ." and "As the tumor grows older it tends to undergo degeneration with production of toxicity." The same criticism applies to sections on the pathogenesis of exophthalmos and exophthalmic goiter. The chapter dealing with the gross anatomy of the thyroid gland would be considerably more valuable if the text were accompanied by gross anatomic illustrations.



This book is felt to be too extensive and detailed for the medical student or general practitioner, but is recommended as a useful reference for those with specialized interest in the thyroid gland.

ROBERT RAINEY, M. D.

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*Campbell's Operative Orthopedics:* By J. S. Speed, M. D., and Hugh Smith, M. D., Second Edition, Vol. I, St. Louis, The C. V. Mosby Co., 1949, with 1141 illustrations, including 2 color plates, 836 pages, pages 1-43: Authors' Index & Subject Index, also Table of Contents.

Campbell's Operative Orthopedics represents a monumental task of reviewing the world literature in orthopedic surgery and gleaned the pertinent information as to new operative technics and incorporating them into the information contained in the first edition of this classic in orthopedic surgery. The second edition not only includes a complete revision of the first edition but it also departs somewhat from the style of the first edition in that the authors have secured collaboration from a number of authorities in compiling this second edition. The entire staff of the Campbell Clinic has cooperated in this revision, together with such outstanding authorities as M. N. Smith-Petersen on mold arthroplasty, D. B. Slocum on amputations, and Francis Murphy on peripheral nerve surgery. The illustrations in the second edition are excellent; photographs of x-rays are considerably more creative than they were in the first edition, and the line drawings are of excellent quality.

This book represents the best in operative orthopedic procedures and should be the principal source book in any orthopedic or general surgeon's library insofar as bone joint surgery is concerned. The inclusion of the authors' opinion as to the efficacy of the various procedures is a welcomed addition in this present two-volume second edition.

JACK WICKSTROM, M. D.

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*Shearer's Manual of Human Dissection:* Edited by Charles E. Tobin, Ph.D. 2nd. ed. Philadelphia, The Blakiston Company, 1949. Pp. 286, illus. Price, \$4.50.

This manual is a dissecting guide designed to be used with additional reading in any of the standard

descriptive textbooks of human anatomy. While it contains 79 line drawings a good atlas would be a necessary adjunct to its use. Dr. Tobin has succeeded in producing a manual which is neither a mere set of directions for step by step procedure in dissecting or one of the classical type with voluminous descriptions and excessive text material.

The arrangement of this book by regions allows considerable flexibility in its use. The general order of dissection can be determined to suit the requirements of the individual instructor.

The method of dissection used is very good. Structures are well exposed for study. The process is not destructive so that normal relationships may be observed, in most cases, after the procedure has been completed.

The use of bold face type throughout the text in indicating important structures and an adequate index are two features worth mentioning.

Dr. Tobin's revision of the original manual has resulted in a very much improved book.

ADRIAN F. REED, PH.D., M. D.

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*An Atlas of the Blood and Bone Marrows* By R. Philip Custer, M. D. Philadelphia, W. B. Saunders Co., 1949. Pp. iii & 321; illustrations 285, 42 in color. Price, \$15.00.

The purpose of this book, as stated in the introduction, is to set forth the principal disorders of the blood and blood forming organs, and to correlate the changes in this system with those which appear elsewhere in the body. It is thus designed for use not only by clinical hematologists, but also by pathologists, clinicians and technicians as well.

The contents are organized into several sections, treating first the mechanism of normal hematopoiesis and its relationship to the blood and bone marrow. This is followed by consideration of various disorders of the blood and bone marrow: deficiency anemias, aplastic and hypoplastic anemias, ectopia of bone marrow, hypersplenism, hemolytic anemias, ill-defined anemias and hemorrhagic states. In similar manner, there then follows consideration of effects of chemical and physical agents, leukocytosis, leukemoid reactions and leukopenia, infections, leukemia and polycythemia. The body of the book is completed by a section on hematologic technique.

One of the most welcome sections of the book is

a four-page discussion of hematologic terminology, with recommendations for usage of terms based on the findings of a committee sponsored by the American Society of Clinical Pathologists and the American Medical Association. Many of the proposed terms are not now in common usage and might well offer a source for misunderstanding, but they are individually defined in the text and should provide a definite, clean-cut point of departure for future usage. As the author points out, a multiplicity of terms should be avoided in an effort to attain consistency. This section alone, is without illustrations. While the cell forms described are depicted elsewhere in the volume, it might be advantageous for the non-expert reader if at least a few, somewhat idealized drawings were to accompany the descriptions.

As the name suggests, a prominent feature of this volume is its illustrations. The figures are selected from typical microscopic preparations of peripheral blood, marrow imprints and marrow sections. In this manner, the importance of the marrow is emphasized, as well as its relationship to the peripheral blood picture. All but a few of the figures are photomicrographs which add an authenticity not possible from use of drawings alone. Photographic illustration is quite adequate *per se* for use by the expert hematologist, but for the less specialized observer, the photomicrograph is often deficient for portrayal of finer cytologic detail so necessary for accurate identification in many of the cell types. One method of obviating this difficulty might be the use of occasional side-by-side illustrations of a single field, where one portion of the figure depicts the finer details somewhat idealized by a drawing, and the other an actual photomicrographic reproduction of equal magnification. The bas relief figures are an excellent medium for illustration of changes seen in cells of the erythrocytic series.

Most of the photomicrographs represent considerable areas of the preparations. This is a highly desirable feature, especially in study of tissue sections where the character of various portions of the stroma is sometimes of paramount importance in diagnosis. The reproduction of large areas is less necessary in illustration of smears and imprints where it serves only to provide a larger field for observation.

Copious use is made of high power magnifica-

tion (2000-2280 diameters) in these illustrations, some of which cover an entire page of the atlas. While the technique of photomicrography and reproduction is of excellent quality, the net result often leaves something to be desired since the outlines of many of the structures shown are markedly hazy. This seems to be the result of an attempt to extend a medium of illustration beyond the practical limits of its application. Many of the larger figures, especially those reproduced in color, can be most profitably studied from a distance of several feet, where the haziness largely disappears.

In both illustration and text material, this volume makes excellent use of bone marrow findings and their relation to diagnosis of hematologic disorders. Heretofore, major importance has been centered on findings in the peripheral blood alone, but here the author has been able to demonstrate the interdependence of the two elements in the art of diagnosis. Particularly pertinent in this connection is the rather detailed consideration of marrow sections, a factor which has formerly received too little consideration.

The final section of the volume deals with hematologic technique, but is confined to the methods of obtaining, preparing and examination of the bone marrow alone. In the opening paragraph of this section, the author postulates that consideration of peripheral blood technique has been adequately dealt with elsewhere. While this is true, the complete omission of the subject from the section somewhat nullifies its effectiveness for use by the non-expert. It might have been more advantageous for the reader if at least a brief summary of blood technique were considered side by side with that of the marrow, with concomitant recommendations for use of both types of material.

From a physical viewpoint, the publisher is to be strongly commended on his success in bringing out this volume. The type face is easy to read, and use of the double-column format is advantageous for covering the material with a minimum of ocular effort. The paper is of excellent quality and while it is ideal for reproduction of illustrations, one might wish for a less heavily glazed surface for the print because of the reflection factor involved.

Ralph N. Baillif, Ph.D.



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## THE USE OF INTRAVENOUS PROCAINE IN THE TREATMENT OF ARTHRITIS

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The intravenous use of procaine hydrochloride has become more widely accepted as a therapeutic method in recent years than ever before, and has been used in a wide variety of circumstances, such as an analgesic in obstetrics, for control of post-operative pain and dressing of burns in surgery, treatment of serum sickness, cardiac arrhythmias, asthma, and the control of pain in the various arthritides. It is the purpose of this report to deal principally with our experience in the use of intravenous procaine hydrochloride in the treatment of arthritis as seen in a general hospital and outpatient practice.

Procaine hydrochloride is an alkaloid, para-amino - benzoyl - diethylaminoethanol, first synthesized by Einhorn over forty years ago in the search for a substitute local anesthetic agent to replace cocaine which has a high degree of toxicity and strong habituation tendencies. Procaine acts quite similarly to cocaine as an anesthetic agent but does not have the severe central toxic

action, is nonhabit-forming, is noncumulative, and produces no liver damage; the latter observations have been studied and confirmed by Jacoby, *et al*<sup>1</sup> in their recent reports of observations on the repeated massive but sublethal intravenous administration of novocain to rats and dogs; and in the continuous infusion of 1-2 grams of novocain over a period of one to two hours in humans. They conclude that the intravenous administration of moderate doses of novocain is a safe procedure as regards the effect on the normal liver, as measured by liver function tests.

Because of the recent interest in the use of intravenous procaine for such varied disease states aforementioned, more detailed study regarding the pharmacology of this drug has been carried out. In the devising of chemical methods for identification of procaine and the products of its hydrolysis, Brodie and associates<sup>2</sup> discovered that an enzyme present in plasma was largely responsible for almost instantaneous destruction of procaine to the metabolites, di-ethyl-amino-ethanol and para-amino-benzoic acid; further that 70-95 per cent of the latter drug is recovered unaltered in the urine; whereas amounts of di-ethyl-amino-ethanol equivalent to only 20-35 per cent of the administered procaine can be isolated from the urine. It was also noted that concentration of procaine in the plasma does not increase with continuous intravenous administration while the concentration of di-ethyl-amino-ethanol does increase, suggesting that the latter drug may be the active agent rather than procaine per se. Recently this has been borne out by Rovenstine and

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Papper<sup>3</sup> in the administration of di-ethyl-amino-ethanol in which they formed the impression that this drug in relatively large doses is equally efficient as procaine as an analgesic.

Besides the hydrolysis of procaine in the blood serum, it is also believed that the liver is instrumental in the breakdown of procaine to its metabolites as well.

It has been observed by pharmacologists in the past that drugs, such as the salicylates, will be found in higher concentration in inflamed tissues. This phenomenon is due to increased capillary permeability which occurs locally in the tissues involved in trauma or inflammatory processes. This concentration in inflamed tissues occurs as well with procaine hydrochloride. It has been shown that procaine concentrates eight times stronger in these inflamed tissues than in normal tissues. The most probable sites of action of procaine and its metabolites in these areas are at the terminal nerve endings themselves, directly, or perhaps by antagonistic action to acetylcholine at myoneural junctions, and by direct action on the endothelium of the blood vessels within the injured capillary bed, or perhaps the antagonistic action against acetylcholine within associated sympathetic ganglia which brings about vasodilatation. An anti-histaminic effect has also been noted in treating penicillin sensitivity reactions, serum sickness, and other allergic manifestations with procaine. This latter effect may be partly responsible for the easier breathing of asthmatics, noted incidental to treatment for arthritis. With this in mind we tried procaine, in the same dosage we use for arthritis, on two cases of status asthmaticus who did not respond to the usual drugs. Immediate, although transitory relief was obtained for an hour or two in both cases.

Following the dosage formula as recommended by Graubard and his associates,<sup>4</sup> it was decided to use a 0.1 per cent procaine hydrochloride solution and give 4 mg. per kilogram of body weight and infuse that dose intravenously at a rate not to exceed 14 cc. per minute. One gram of procaine

was first dissolved in a small quantity of normal saline and added to 1000 cc. of normal saline. Vitamin C (1 gram per 1000 cc. solution) was also added since it has been demonstrated that many arthritics are low in Vitamin C, and that Vitamin C deficiency leads to a greater incidence of unpleasant side effects during administration of procaine. It is suggested to use 5 per cent glucose in distilled water instead of normal saline as the medium in which to mix the procaine if the patient is a cardiac or on a salt restricted diet for any other reason.

A wheel cart was devised, which could be rolled from one room to another, containing all the necessary solutions, drugs and apparatus in one unit to facilitate administration of intravenous procaine. Although no untoward reactions were encountered in this series of cases, it was deemed advisable to have on hand a soluble barbiturate in the event of any convulsive signs, and metrazol and oxygen for any respiratory distress while procaine was being administered. Aromatic spirits of ammonia were used to counteract occasional vertigo experienced by a few patients.

Although the majority of our patients were hospital cases, they were treated with procaine as an outpatient procedure; that is, they would go to the treatment room, receive procaine and then proceed back to their ward unaccompanied. Outpatients can proceed home within a few minutes after the treatment.

Before starting a new patient on treatment, inquiry was made relative to previous injections with procaine and whether any untoward effects were experienced; since some people are known to exhibit an idiosyncrasy to procaine. With a patient in whom no history can be obtained of taking procaine previously, it would be advisable to skin test with 0.1 cc. of a 1 per cent solution of procaine, and if no systemic signs of toxicity are manifest it is safe to proceed. On the first infusion it is a good practice to run the solution slowly and observe the patient closely.

The first sensation experienced by the

patient during the infusion is a sense of warmth, usually in the epigastric region, about the face, or generalized, and this usually lasts for a few minutes following cessation of a treatment. Some patients experience slight vertigo, which if it becomes marked, can be easily controlled by slowing the rate of infusion. No severe side reactions of note have yet been observed.

A few patients experienced relief of pain during or following the first treatment, but most of them took three infusions over a period of one and one-half weeks before decided improvement was noted. It would seem that before the effect of the treatment in an individual can be determined, he should receive at least three infusions.

Fifty-six cases of arthritis and allied conditions were studied in this series. A total of 220 procaine infusions were given this group.

Twenty-nine patients with osteoarthritis were treated, of whom 21 received marked relief from pain and stiffness; the remaining 8 had transitory relief. In this group labeled osteoarthritis were 3 advanced cases of the Marie-Strümpell type. Two of these patients experienced much relief.

*Case No. 1.* White male, 40 years old, veteran of World War II, with history of pain in back since 1942. Since that time he had little relief from pain in spite of treatment with hot baths, a three months' course of gold salts therapy, and a course of x-ray therapy to the spine. X-ray revealed arthritis of the spine of the Marie-Strümpell type. The patient weighed 69 Kg. and received 276 mg. of procaine on December 27, 1948. Two more infusions were given during the following week. He then experienced much relief from pain, was discharged from the hospital, and followed for two months as an outpatient, returning once a week for a procaine infusion. He has not required further treatment to date.

Seventeen patients with rheumatoid arthritis were treated, of whom 9 were greatly benefited; the rest received transitory relief from pain. In this group it was observed that the best results were obtained during acute exacerbations of rheumatoid arthritis, rather than with chronic types.

*Case No. 2.* White male, 23 years old, veteran of World War II, discharged from Navy with rheumatoid arthritis. He had been treated in a Veterans Hospital for six months following dis-

charge from service. He had returned home and was taking codeine, salicylates, and applying liniments to affected joints. When first seen at the hospital he had pain in the temporomandibular joints, knees, feet (including toes) left hip, shoulders, and wrists. One wrist was reddened and swollen. The patient weighed 50 Kg. and was given 200 mg. procaine on December 16, 1948. Later that day he noticed increased mobility in the temporomandibular joints and left hand. During the following week he received two more infusions, at the end of which time he could walk without pain and eat solid food without pain in his jaws. He was allowed to go home over the Christmas weekend and returned with improvement sustained. He was then discharged from the hospital and followed as an outpatient, returning twice a week for the next two months. Improvement was sustained. Patient obtained a job and at this writing is still actively engaged at work.

One patient with chronic brucellosis and continuous back pain, but no x-ray evidence of bony changes, received complete relief with three infusions.

One patient who had muscle spasm following surgery of the knee experienced transitory relief of spasm and pain for three to four days after each treatment.

Three patients with pain in the extremities, incidental to hemiplegia, obtained marked relief of pain and were more readily ambulated.

In a group consisting of one case of fibrositis, one case of subdeltoid bursitis, and one case of acute sacroiliac sprain, fair results were obtained but there were not sufficient cases of these types studied for a good evaluation of therapy.

Although entirely unrelated to the group above, 2 cases of status asthmaticus were given procaine with marked improvement in respiration for from one to two hours.

#### CONCLUSION

1. Fifty-six patients with various conditions were treated with intravenous procaine.

2. A total of 220 infusions were given, most patients receiving an average of 3 to 4 treatments.

3. Best results were noted in osteoarthritis and acute rheumatoid arthritis.

4. It was also found to be a useful procedure in sprains, fibrositis, muscle spasm following surgery, and pain incident to hemiplegia.



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## VIRAL HEPATITIS

REPORT OF TWO CASES TREATED WITH CHLORAMPHENICOL

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Reimann<sup>1</sup> stated in a recent review of infectious diseases that viral hepatitis resists specific therapy. Two cases are presented which were treated with chloramphenicol.

## CASE REPORTS

Case No. 1. L. L., a white male, aged 42, became suddenly ill on November 11, 1949 with chills, fever, headache, and malaise. He had no other symptoms and had been in good health all his life. He had a hemorrhoidectomy fifteen years ago. For the past seven years he had been employed in an oil refinery. There was no contact with industrial toxins, and he denied indiscreet indulgence in alcohol. There was no history of recent venepuncture or inoculations.

The temperature on the third day was 103.4° F., pulse 92, respirations 18, and the blood pressure 134/82 in both arms. His weight was 192 lbs. The eyes, ears, nose and throat were normal. Auscultation and percussion of the chest revealed no abnormality of the heart or lungs. There was, however, tenderness to fist percussion over the area of liver dulness, which extended to the fifth rib anteriorly. The liver was palpable on deep inspiration 3 centimeters below the costal margin. It was tender and the edge was smooth. The spleen was not felt, and the remainder of the abdomen was soft and tympanic. No other areas of tenderness were noted, and no masses were palpable. The genitals, rectum, skin, bones, muscles, and joints were normal. There was no superficial lymphadenopathy.

The urine analysis revealed a straw color and acid pH. The specific gravity was 1.018. Albumin and sugar were not detected. There was an occasional leukocyte in the sediment. Hemoglobin measured 16.6 grams. Total R.B.C. were 4,950,-

000. The W.B.C. were 9,150. There were 46 segmenters, 2 bands, 47 small lymphocytes and 5 eosinophiles. Ova of *Enterobius vermicularis* were found in the feces. The serology was negative. The cephalin flocculation was 3 plus in forty-eight hours and the icterus index was 8 units. A chest roentgenogram was normal.

He was placed on bed rest and a dietary intake of 350 grams of carbohydrate, 175 grams of protein and 130 grams of fat. Chloramphenicol was started orally on the fourth day. Initially he was given 1 gram every hour for three doses followed by ½ gram every three hours for a total of seventy-two hours. High potency multivitamins, infusions fortified with vitamins B and C, and choline 1 gram three times daily were given as supportive measures.

The temperature was normal on the fifth day, and he remained afebrile for five days, when his fever returned and ran a low grade course until the fifty-seventh day of the illness. Serial cephalin flocculation tests were 2 and 3 plus on the eleventh, twenty-first, twenty-ninth, and fifty-first days. On the sixtieth day the test was negative and on the sixty-fifth day the thymol turbidity test was 2 units. He has been well since, and subsequently a cholecystogram and gastrointestinal series were normal.

Case No. 2. L. B., a white male, aged 17, developed pain in the right aspect of the epigastrium on December 13, 1949. He had slight nausea. His symptoms had been present two hours when seen. He stated his pain was intermittent and lasted for about five minutes at a time. He had no other symptoms and his health had been good since childhood. There was no history of excess alcohol, recent venepuncture or inoculations.

The temperature was 98.6° F., the pulse 108 per minute, respirations 32, and the blood pressure was 118/72. He was emotionally upset and feared he had appendicitis. The eyes, ears, nose, and throat were normal. The heart rhythm was regular and the sounds were normal. The lungs were clear bilaterally. There was tenderness on fist percussion over the area of liver dulness superiorly to the fifth anterior rib. The abdomen was soft and tympanic. The liver was palpated 3 centimeters below the right costal margin on deep inspiration. It was moderately tender and the edge was smooth. No masses or other areas of tenderness were noted. The skin, genitals, rectum, bones, joints, and muscles were normal. There was no palpable lymphadenopathy.

The urine analysis was normal. Cysts of *Endolimax nana* were observed in the feces. The hemoglobin was 13.8 grams. Erythrocytes numbered 4,600,000. Total white count was 4,350. The differential was as follows: juveniles 1, bands 9, segmenters 57, eosinophiles 2, basophiles 1, lymphocytes (small) 29 and lymphocytes (atypical) 1. The STS was negative. The cephalin flocculation

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on the second day was 2 plus in forty-eight hours.

He was placed on a similar supportive regimen as case No. 1. His temperature rose daily to 99° to 101° F. On the ninth day he was passing clay-colored stools, although he was not visibly jaundiced, and the cephalin flocculation was 3 plus. It was again 3 plus on the eighteenth day. On the twenty-fifth day chloramphenicol was begun 1 gram every hour for three doses and then ½ gram every three hours for seventy-two hours, followed by ¼ gram every three hours for an additional forty-eight hours. During therapy with chloramphenicol he remained afebrile. The cephalin flocculation was 2 plus on the next to the last day of therapy. Fever returned seventy-two hours after the antibiotic was discontinued. On the thirtieth day the thymol turbidity was 15 units. During the fifth week of illness there was fever every two or three days of a degree or less. On the forty-fourth day the thymol turbidity was 4.5 units.

#### COMMENT

The chronicity of viral hepatitis and the invariably final morbid status of the rare instances of cirrhosis as its sequela are indications for rigid control of all patients with this disease. The diet should be pushed to full limits of tolerance, and the adjuncts, vitamins and lipotropic substances, given. Strict bed rest is indicated as long as symptoms and liver function tests reveal hepatic cell damage. In addition, there is a great need for specific therapy. Chloramphenicol was administered to two patients with viral hepatitis. In both there was a remission of fever during therapy with recurrence of fever after the drug was stopped.

#### CONCLUSION

Chloramphenicol may be efficacious in the treatment of viral hepatitis. Two cases are presented. Prolonged use of chloramphenicol on well controlled cases of "viral" hepatitis is indicated.

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## UNCOMPLICATED GASTRIC AND DUODENAL PEPTIC ULCER\*

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AND

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NEW ORLEANS

Desire and obvious necessity for limitation characterize the title of this presentation. Publications, scientific and otherwise, prevail in the medical and lay literature, yet both the nature of this disease and its successful management remain largely hypothetical. However, the ulcer patient, individualized and competently managed by one understanding the disease, does well in "long term" evaluation and rarely develops a complication. Conversely, the situation is an unhappy one fraught with complication where incompetency characterizes the attending physician. This situation probably sponsored Sara Jordan's<sup>1</sup> statement: "The distressing end results of neglect and of ineffective treatment as well as the disabling and depressing effect of the disease itself challenge our best efforts toward the solution of this problem of peptic ulcer," and justify our somewhat routine review of the subject.

Ivy<sup>2</sup> feels that 10 per cent of our population at some time develop a peptic ulcer and that over a ten year period there are approximately 1,500,000 ulcer patients in the third decade of life. Jennison<sup>3</sup> encountered 7 per cent duodenal ulcers in 2700 unselected fluoroscopic examinations. A cadaveric incidence of 11.85 per cent is recorded by Robertson and Hargis.<sup>4</sup> Portis and Jaffe<sup>5</sup> report ulcers present in 5.2 per cent of autopsies on white people. In ambulatory private gastrointestinal practice (1000 consecutive cases), we encountered peptic ulcer in 22 per cent of patients. Private hospital

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(Touro Infirmary) incidence in the past decade revealed a 37.8 per cent incidence of 5853 gastrointestinal admissions and accounted for 3.7 per cent of all hospital admissions during the same period. In the previous ten year period a 26.5 per cent of 8353 gastrointestinal admissions and 4.6 per cent of all hospital admissions was recorded.

Statistical evaluation substantiates Ivy's<sup>2</sup> approximation of a 10 per cent incidence in the adult white male and justifies an impression of increasing prevalence of peptic ulcer.

#### ETIOLOGY

The genesis of the disease persists speculative. No single factor satisfactorily explains the development of every case of peptic ulcer. Coalition of hypersecretion (hydrochloric acid), hyperirritability (muscular spasm) and tissue susceptibility to the forementioned two undeniably are essential to the production of an ulcer. The primary motivating etiologic influence remains unknown. The contribution of infection, toxic effects (alcohol, smoking, and drugs), trauma (internal and external), vascular disorders, allergy, histamine (used therapeutically), gastritis, nutrition, endocrine, emotion, and a host of other possibly precipitating influences are repeatedly revived. Sex apparently has an unexplained relationship in that duodenal ulcers are significantly more frequent in males. Age seems irrelevant although the third decade of life is the ulcer period.

Inability to reproduce experimentally a peptic ulcer other than that simulating the postoperative gastrojejunal lesion permits considerable speculative freedom which is academically interesting but rarely of practical application. The experimental production of peptic ulceration by histamine, cinchophen, and mecholyl may materialize into a source for adequate study. How important each etiologic possibility is in the individualized ulcer patient is a decision probably essential to intelligent therapeutic application.

#### SIZE

Consideration of ulcer size, though of interest, has minimal clinical importance.

Gastric ulcers averaging 1.5 centimeters are usually larger than the duodenal lesions which average less than 0.5 centimeters.<sup>6</sup>

In relation to malignancy it has been estimated that while 80 per cent of gastric ulcers are less than 1.8 cm. in size, 71 per cent of gastric carcinomas exceed a 4 cm. diameter.<sup>7</sup> While the exception does not prove the rule it often embarrasses it. We have never granted diagnostic or prognostic significance to ulcer size, although we are influenced prognostically by depth indicating degree of penetration.

#### SITE

That the majority of gastric ulcers are on the lesser curvature in the vicinity of the angularis and rarely occur on the posterior wall is of interest and importance.

Duodenal ulcers are common to the first 2 centimeters beyond the pyloric ring adjacent to the lesser curvature border. Postbulbar ulcers are now being roentgenologically diagnosed more frequently.<sup>8</sup>

While we tend to doubt benignancy in a posterior wall gastric ulcer and anticipate more probable perforation in anterior wall lesions, beyond this we feel locations, like size, lend little to clinical evaluation in the individual patient.

#### DIAGNOSIS

Characteristic ulcer distress suggests the presence of peptic ulceration. Confirmatory diagnosis depends entirely on the roentgenologic demonstration of either an ulcer crater or anatomic changes produced in the mucosa about the ulcer and by the contraction of the scar tissue in duodenal ulcers. Brown and Harper<sup>9</sup> stress the importance of the right lateral horizontal roentgen study. Gastroscopy complements roentgenology in the study for gastric ulceration.<sup>11</sup> In meticulous diagnostic study of 200 consecutive cases, in which the clinical evaluation insisted on the diagnosis of peptic ulcer, the roentgen study was confirmatory in 83 per cent; gastroscopy gave a supplemental 2.5 per cent to bring the confirmed incidence to 85.5 per cent. In the elimination of ulcer simulating disease adequate explanation was revealed elsewhere in 7 per cent. Therapeutic response to ulcer management permitted us to haz-

ard a diagnosis of "ulcer occulta" on the remaining 7.5 per cent of cases. Such a diagnosis requires constant observation and repeated diagnostic surveys to substantiate itself and has never given us a sense of security in handling the patient.

Among the diagnostic aids one must mention gastric analysis. Histamine achlorhydria never occurs in patients with an active peptic ulcer. Gross blood in the gastric content suggests an ulcerating lesion. Cytologic and chemical study of the gastric secretion may aid in establishing the existence of neoplasia. Melena is highly significant. The hematologic picture is not conclusive; anemia is expected with chronic blood loss from ulceration; conversely, duodenal ulcer is reported concomitant with polycythemia.

Gastrophotography, Woldman's phenolphthalein test, gastrographic observations, and Einhorn's string test are mentioned only for completeness.

We are not projecting this manuscript beyond benign lesions other than to state that all gastric lesions are suspected of malignancy until their benignancy is assuredly proved.

#### HEALING

Factors influencing healing include proper advocacy of therapy, acceptance of the regime, and actual potentialities of healing. The size of the lesion, the amount of scar tissue adherence of the ulcer base to contiguous structures, and the age of the patient, each is concerned in determining potentiality of healing. Complete healing may never occur in some cases. When the ulcer history indicates long duration with brief remission periods in a patient beyond 45 years of age, complete or rapid healing is not anticipated.

Disappearance of the roentgen niche often occurs early; while prognostically favorable it is not criteria for complete healing.

In general, it is conceded that a gastric ulcer leaves no scar unless the ulcer has been very large and deep. Penetration often results in extensive distortion by scarring in the process of healing. While

many anterior wall duodenal ulcers heal with minimal gross scarring most of those located on the posterior wall form extensive cicatrization and concomitant lumen constriction. The postpyloric ulcer often by scarring lumen constriction produces a megaduodenum and the potentiality of prestenotic pseudodiverticulum of the cap area.

Our roentgen follow up of 100 duodenal ulcer cases, asymptomatic for twelve months, revealed a demonstrable crater present in 12 and a scarred or deformed duodenum in 20 additional cases. Templeton<sup>10</sup> remarks: "In most instances a deformity of the bulb changes not at all or only slightly as the crater disappears." Fifty gastric ulcers, of the same period of quiescence, showed no roentgenologic or gastroscopic evidence of the previous site of ulceration. In a study of 200 instances of ulcer recurrence the crater was found at the site of the original lesion in 86 per cent indicating to us the probability that complete healing of the ulcer had not occurred. We have not been able to duplicate the remarkable average time for healing duodenal ulcers (thirty-seven days) approximated by Cummings, Grossman and Ivy.<sup>11</sup>

#### CURE

We consider as two distinct entities the duodenal ulcer and the gastric ulcer. To evaluate our management of the ulcer patient we completed two ten year follow-up surveys. The first of these, previously reported in part, was completed in 1938, the second in 1948. Meticulous case study and personal interview, in preference to questionnaire inquiry, were elected. Therefore, neither is a series of consecutive cases and each ten year study was limited to 100 duodenal initially uncomplicated ulcer patients. The study included only patients hospitalized for initiation of therapy. This composite study revealed that 98 individuals so managed may be classified as ten year "cures". Thirty-eight were considered satisfactory in that recurrent symptoms were easily managed; they remained uncomplicated, disability was insignificant and more or less an elective state. There were 22 un-



satisfactory results in that, despite lack of demonstrable complication, recurrences, though not severe, were frequent, refractory, and the degree of disability created an economic problem. Six who had surgery against our advice are partially disabled. The remaining 42 developed ulcer complications and from this viewpoint were unsatisfactory. These included 27 instances of hemorrhage; 16 were medically managed through a single bleeding episode, 7 through multiple exsanguinating illnesses; 3 required emergency surgery. Surgical management of acute perforation in 6 instances was successful. Medical management of 2 perforations (surgery refused) resulted in uneventful recovery from acute illness. There were 19 obstructive ulcers; 12 of these were measured to be of beyond 50 per cent six hour retention with lack of therapeutic response, and were therefore advised to have elective surgical correction. Ten consented, 2 have continued on a medical program. The remaining 7 whose retention is less than 50 per cent and intermittent are still under continuous medical observation. There was no instance of coexistent gastric carcinoma with duodenal ulcer in this series.

In summarization, this critical analysis of our own management of duodenal ulcer patients revealed a comparable result in the two ten year periods, indicating no evidence of improvement in our therapeutic program.

98 or 49 per cent are classified as "cures."

38 or 19 per cent are satisfactory results.

22 or 11 per cent are uncomplicated unsatisfactory results.

42 or 21 per cent are complicated poor results.

A clinical and physiological difference exists between gastric and duodenal ulcers, possibly a consequence of location of the lesion and related to inhibitory secretory and motor mechanisms present in the normal duodenum. This reasoning loses value when one observes that a gastric ulcer concomitant with a duodenal ulcer heals more readily than the duodenal lesion.

In the period there were 86 instances of gastric ulcer similarly available for survey. Seventy-four healed and remained healed,

12 recurred and were resected. From this limited study one would gather confirmation that benign gastric ulcers respond to therapy more satisfactorily than do duodenal ulcers. In no instance of this series, nor in 52 additional cases of gastric ulcer with a five year follow-up, have we reversed the initial diagnosis when confirmed by therapeutic response, and we therefore incline toward medical management of gastric ulcers with preservation of gastric physiology despite the surgical concept of resection reassurance against malignancy.

Recurrences in duodenal ulcer by annual estimation revealed 15 per cent in the first year, 21 per cent in the second year, 11 per cent in the third year, 6 per cent in the fourth year, and only 3 per cent in the remaining five years. This would tend to indicate a five year evaluation to be fairly accurate but does not conform to the findings in Flood's<sup>12</sup> excellent statistical evaluation showing recurrences every year through a fifteen year follow-up.

Our statistics, conforming well with those of early and undenied reports of Jordan and Keefer, Crohn, St. John and Flood,<sup>13</sup> do not permit optimism or contentment with our present management of the ulcer patient.

This therapeutic story does not approximate that of those happy authors advocating their new and successful methods of management where a "cure" is reported in an average 87 per cent but it must at once be recognized that we are interpreting our results from accurate ten year follow-ups. We therefore feel that our statistics give a fair evaluation and permit us to claim a studied estimate of the ulcer situation and its control.

#### TREATMENT

In the management of the peptic ulcer patient we wish to gain three points: (1) symptomatic relief, (2) ulcer healing, and (3) recurrence prevention.

In the sincerity of investigation a complete medical diagnostic survey in a methodical manner is specified. This has a reassuring influence on the skeptical patient and is thereby a part of therapy. It may

necessitate an informal neuropsychiatric survey dwelling on analysis and perhaps adequate endocrine study. A sincere attempt to evaluate allergy and the place of tobacco in those possibly sensitive, an effort to estimate rest requirement, mental and physical, and a decision as to whether ambulatory or hospital medical management is to be elected are each exacted. From this thoroughness and individualization one approaches the treatment of the person with the ulcer as well as institution of measures directed toward the cure of the ulcer itself. We must therefore create for ourselves and in our patient a broad concept of peptic ulcer disease. The physician and patient each reviewing the disease estimate its relationship to various etiologic possibilities and make adequate corrective measures before entering into the routine of caring for the ulcer itself. Then, speaking in terms clearly understood by the patient, a program is agreed to. Several principles are exacted. The gastric ulcer case always is hospitalized for initiating therapy, the gastric ulcer must heal roentgenologically and gastroscopically within eight weeks and stay healed or it becomes a surgical problem. A two year program is anticipated in the cure of both gastric and duodenal ulcer patients. Gastric ulcers are roentgenologically checked every three months after healing for two years and then annually for life. Duodenal ulcer patients are roentgenologically checked semi-annually from the onset for two years.

In duodenal ulcer patients the election to hospitalize an individual is often an essential to evaluation. Separated from environmental influences the personality type becomes more obvious, rest becomes possible, relaxation practical, dietary and therapeutic measures easily applicable. Tanner,<sup>14</sup> in addition, indicates recumbency to diminish gastric activity, decrease venous stasis, increase blood supply, and favorably alter the gastric acidity. It is obviously true to the observant physician that symptomatic response is more rapid in hospitalized patients; that they are subsequently more easily managed, and we therefore

favor such management where practical.

The basic therapy beyond measures to achieve physical and mental rest are all extended to obtain gastric rest whereby hyperirritability and hypersecretion are controlled. These measures considered individually include (1) diet; (2) antacids; (3) constant drip measures; (4) drugs of antispasmodic and sedative action; (5) incidental measures: (a) mechanical, (b) parenteral preparations, (c) gastric radiation, (d) hormones, enterogastrone and mucosal extracts, (e) psychotherapy.

#### DIET

Diet is probably the most important part of the program. The diet must be practical, calorically adequate, individually applicable, relatively devoid of gastric motor and secretory stimulation. The program should be stipulated as frequent small feedings, whereby quantitative gastric distention with resultant peristaltic contraction is eliminated. Small feedings excite less secretory response; frequency permits better secretory neutralization.

Secretagogues such as meat extracts, seasoning, condiments, and alcohol are eliminated. Cellulose and meat fibers, considered possibly traumatic, are restricted. Semiliquid consistency would indicate minimal requirements for macerating function. Carbohydrate leaves the stomach too rapidly; fats remain in the stomach too long. The ideal therefore seems to be a combined food.

The ideal food is milk. Milk allergies (5 per cent) or idiosyncrasies exist, and when recognized, suitable substitute such as gelatins, cream soups, strained chicken and lamb broth, and strained cooked cereals must be used. Conception of milk sensitivity may be ameliorated by boiled milk, evaporated milks, addition of lime water and non-allergic preparations.

Our concept of the dietary management is a four step program:

1. The hospital ulcer dietary regimen is insisted upon for all gastric ulcer patients and advocated for all duodenal ulcer patients. Only when circumstances arising from hospitalization create too great an or-



deal for the individual do we agree that the program might best be initiated with the patient ambulatory.

2. The ambulatory ulcer dietary regimen should closely adhere to the program initiated in the hospital with hourly feedings, as charted, when possible, until the physician is convinced that healing has progressed satisfactorily, and then is changed at an arbitrary six weeks to the early ulcer diet.

3. When a three month satisfactory symptomatic response has been achieved we then advocate a normal ulcer diet, which is adhered to for approximately eighteen months. The patient is advised to revert back to his earliest program upon the slightest recurrence of symptoms, during acute respiratory and other infectious illness, when under unusual mental or physical stress and at the time of anticipated seasonal activation. Timing of feeding may be, of course, adjusted to the patient's working hours but we do not feel that ulcer patients do well on alternate shifts as exacted in some industries.

Susceptible to exploitation, the ulcer diet has been often dramatically supplemented by nutritional adjuncts. Protein hydrolysates are accredited with creditable buffering action and a valuable source of nitrogen intake; there is, however, no conclusive evidence that they are therapeutically indicated since a protein deficiency is not uniformly present in ulcer patients, nor are they as efficient as standard antacids. Ascorbic acid should be added to or included in the diets of patients in all instances, since there is convincing evidence in the literature indicating an actual need.

#### ANTACIDS

Antacids are almost unanimously endorsed as essential therapy. Complete neutralization of gastric acid-pepsin secretion may be possible but hardly practical other than for hospitalization periods. It is not considered essential to satisfactory ulcer management. However, reduction in acid-pepsin gastric content is conducive to control of ulcer manifestations in all instances,

and especially when hypersecretion and hyperacidity are prominent.

Seniority and common usage keep ever prominent the soluble antacids,—sodium bicarbonate, magnesium oxide, and magnesium carbonate. Less frequently used alkalis, such as calcium carbonate, sodium and potassium citrates, tribasic calcium and magnesium phosphates, and the bismuth salts, are often used in various patented alkaline powders. A combination of calcium carbonate with small amounts of magnesium oxide and one of the bismuth salts is the most efficient combination with the least deleterious effect. Bismuth subcarbonate is applicable in the presence of diarrhea. While both efficient, pleasant, and inexpensive, it must be remembered that in using soluble alkali freely one risks the danger of change in acid-base balance of the blood secondary hypersecretion, and renal calculi. In powder or tablet combination they are still widely used and when properly applied deserve their prominent therapeutic position.

Nonabsorbable antacids, such as colloidal aluminum hydroxide and phosphate, both in the reactive and non-reactive forms, have gained overwhelming favor in recent years. We avoid their use in stasis since they have a tendency to delay gastric emptying. The formation of aluminum chloride, irritating to the stomach unless alkali is present to reconvert it, is a disadvantage. In deficiency of pancreatic juice or in diarrhea they may produce phosphorus deficiency. These side effects, plus anorexia with resultant nutritional disturbance and constipation, detract from their efficiency.

Magnesium trisilicate in combination with colloidal aluminum hydroxide is more effective than aluminum hydroxide alone. It tends to combat the costive action of aluminum hydroxide, but alone lacks the neutralization efficiency and astringency of aluminum hydroxide.

Resins,<sup>13-15</sup> reputed symptomatically effective but lacking ability to prevent complications, are expensive. They have negligible toxicity, and minimal side effects of unpleasant taste, nauseating and emetic in-

fluence. In our experience resins in their limited efficiency have their only advantage in that the patient is offered something different.

Protein hydrolysates<sup>16-18</sup> are nutritional adjuncts and not efficient acid-pepsin buffers. Despite enthusiastic reports, there is no conclusive evidence that hydrolysates are superior to a standard antacid regimen, and they are both expensive and distasteful.

Gastric mucin,<sup>21</sup> vegetable mucin,<sup>22</sup> and pectin<sup>23</sup> apparently have too little neutralizing power, are difficult to administer, expensive, and seem inadequately evaluated for the endorsement given them by the few reporting favorable response.

The antacid chosen must be given frequently, hourly when hospitalized, and where practical, in the initial ambulatory period. Tablet form is convenient for the patient but must be given in adequate quantity.

#### CONSTANT DRIP THERAPY

When neutralization is unsatisfactory, or symptomatic response is lacking in the patient with an uncomplicated ulcer, whose dietary outline is proper, and on whom the use of neutralizing agents has been intelligently applied, there may exist an indication for constant drip therapy. We frankly feel this is best applicable for its psychic influence on the disgruntled, refractory patient for whom something different must be offered. This is the only indication we appreciate for its application, and we only favor the use of the aluminum hydroxide drip.

The intragastric alkalinized milk drip of Winkelstein introduced in 1933, and the aluminum hydroxide drip endorsed by Woldman in 1936, each has a rational basis. Soresi's continuous nutrient drip into the esophagus is unphysiological and irritating. Young's penicillin intragastric drip lacks a rational basis and confirmation. Jejunal alimentation advocated by Einhorn is not applicable to the uncomplicated ulcer case.

#### DRUGS

Drugs other than antacids in ulcer management are few. To influence motor and

secretory activity one of the most commonly used drugs is an antispasmodic or supposed antispasmodic. Should spasm exist and be symptomatic, which is more often presumed than actual, an effective antispasmodic would be a therapeutic triumph, but none effective and long acting, free of distressing side effects, is available. It is true belladonna and its alkaloid atropine depress or abolish motility but they have no demonstrable effect on tonus. The synthetic antispasmodics have not lived up to their reputed efficiency.<sup>19, 20</sup> Papaverine, because of its habit-forming potentialities, has limited applicability. Tetraethyl-ammonium chloride has been reported to be an effective pain reliever with minimal side effects, no effect on motility, and possibly some secretory inhibition, theoretically acting as a circulatory alternant, but it must be administered parenterally and is only considered for hospitalized patients.

Despite lack of proved value we favor belladonna in the presence of persistent pain and in instances of pyloric obstruction. We cannot physiologically rationalize a claim that a medical vagotomy is achievable by atropinism.

Sedatives aid in achieving rest, and in allaying anxiety and emotional tension. As such they are also antispasmodics, and certainly enhance the effectiveness of the presumed antispasmodics. Preference for barbiturate over bromide is only with reference to ease of administration; idiosyncrasies to various sedatives are individual problems.

#### INCIDENTAL MEASURES

The continuous or intermittent mechanical removal of gastric content in stasis and hypersecretion, both therapeutically and in evaluation of therapy, has definite applicability especially in instances of retention.

Nonspecific proteins and vaccines, among the more prominent of which are milk protein (Aolan),<sup>24</sup> lipoproteins with emetine<sup>25</sup> (Synodal), polyvalent respiratory vaccine<sup>26</sup> along with histadine (Larostidin)<sup>27</sup> and histamine desensitization,<sup>28</sup> each lack rationalization, and efficacy is discounted in control studies.



Radiation therapy, by Palmer and his associates,<sup>29</sup> producing a period of achlorhydria adequate to permit ulcer healing, is apparently effective in proportion to the reduction in gastric secretion. Evaluation by these competent observers is impressive, but the incidence of recurrence admitted detracts from the enthusiastic therapeutic claims. Hamilton<sup>30</sup> has reported assumed gastric ulcer production following radiation.

The hormonal approach, still under experimental study, gives hope for ulcer recurrence prevention either by reduction in acid secretion or by increasing mucosal resistance. Gastric, duodenal, and intestinal mucosal and submucosal extracts are under consideration. Entero-gastrone,<sup>31-33</sup> widely discussed now, appears an impractical, expensive, inadequate measure in well controlled studies recently completed. Rivers<sup>34</sup> and others have hope for the gastric and duodenal extracts, but their actual status is as yet undetermined. Extract of pregnant mare's urine, in the opinion of Page,<sup>35</sup> deserves continued evaluation.

Interest in psychosomatic medicine is so intense, and stress and strain, anxiety and uncertainty, are so prevalent in our present era that there is a tendency toward formal psychiatric management in the ulcer patient. Zane<sup>36</sup> claims "tension" a common factor in all cases psychiatrically studied. Moses<sup>37</sup> studied ulcer cases characterized by insecurity with electroencephalography and classified them dominant alpha index. It is admitted that of the somatic diseases influenced by the psyche, that is, diseases other than the neoplastic and infectious, the psyche enjoys its greatest character role in peptic ulcer. Nevertheless, the somatic element is dominant with variation in relative psychosomatic over somatopsychic interplay. This involves only good application of the "art of medicine" in the individualization management of the ulcer patient with formal psychotherapy applicable only when the separate psyche entity is a departure from the ulcer problem.

The psychosomatists have attempted a

division into four different types of ulcer personality:

1. Aggressive, ambitious, successful, independent.
2. Energetic, obsessive, shy, successful, dependent.
3. Shy, not aggressive, unsuccessful, completely dependent.
4. Character disturbances, irresponsible, psychopathic.

It would conceivably be possible to classify our patients with major diseases in the same fashion. It is difficult to discern what practical application such has to the ulcer problem.

New methods and new drugs for the treatment of peptic ulcer appear with monotonous frequency. A complete list of various measures advocated and discarded as a part of ulcer management would approach indexing proportions and would only serve to indicate conservatism and justifiable skepticism in accepting "short term," unconfirmed therapeutic measures. In this respect it is interesting to review the recent evaluation of various therapeutic possibilities on Mann-Williamson dogs by Saltzstein and his associates.<sup>38</sup>

#### RECURRENCE PREVENTION

From our survey the conclusion is obvious that we can hope for "cure" in only approximately 50 per cent of duodenal ulcer cases. In an effort to determine the precipitant of recurrent symptoms we evaluated the factors concerned as ascertainable in 500 cases with a recurrent history. No satisfactory explanation for reactivation could be elicited in 27 per cent. Dietary indiscretion, including injudicious use of alcohol, was the most frequent source of recurrence, representing 31 per cent. Emotional trauma, prominent in the form of insecurity, was present in 16 per cent. Unusual fatigue accounted for 10 per cent. A seasonal influence was suggested in 8 per cent. Smoking was a possibility in 5 per cent. Infection of significant relationship was present in 2 per cent. External trauma was suggested in 1 per cent. However, in 62 per cent of these same cases with multiple recurrences, a different precipitant was accused for another episode of ulcer symptomatology. This leaves incon-

clusive assistance to any plan of therapy for recurrence prevention other than continued careful ulcer patient management.

#### CONCLUSION

The ulcer patient presents an incompletely solved problem of increasing magnitude. With etiology uncertain, it follows that therapy must be speculative to a considerable degree. There is evidence of general admission that the true nature of the disease anticipates a majority of "cures" for gastric ulcer, a reasonable percentage (50 per cent) of "cures" for duodenal ulcers. Since this treatise deals with uncomplicated ulcers, there is no comparative therapeutic issue with surgical measures. There is, in our opinion, justification for reservation in the enthusiastic attitude of the surgeon for attacking all gastric ulcers. In general, we feel the uncomplicated ulcer patient has every reason to be satisfied with his prognosis even though the physician can hardly be content and should continue search for the unknown that will increase tissue resistance since he cannot permanently control gastric hypersecretion and hypertonicity. Nevertheless, we should not endorse, without evaluation, the constant influx of therapeutic panaceas thrust upon the ulcer patient.

Long term evaluation with consideration of the ulcer patient like the diabetic, "once a priest always a priest" inculcation of this concept in the patient and physician probably promises the best result in our present therapeutic limitation.

Note: Since this article was submitted for publication, we have treated a controlled group of thirty-nine duodenal ulcer patients with Banthine (SC 1703) (G. D. Searle and Co.) with complete symptomatic relief but no roentgenologic evidence of satisfactory ulcer healing in a 120 day follow-up.

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#### DISCUSSION

1. Question: What is the rationale of vitamins, especially parenterally, in ulcer therapy?

Answer: In the first place, there is no indication for vitamins in any disease unless there is clinical evidence of deficiency. It is commonly felt that the average diet given an ulcer patient is deficient in vitamin C. The diet we outline omits the citrus fruit juices and other direct sources of vitamin C and we therefore supplement it with vitamin C. If prolonged illness in ulcer patients has produced deficiency, vitamins are given where indicated. Besides Vitamin C, a frequently indicated one is B complex, theoretically because of a hepatic deficiency. As common practice we rarely find indication for vitamins other than vitamin C as a supplement to diet. As to giving vitamins parenterally I fail to see any reason unless it be, (1) that the patient is unable to swallow vitamins because of esophageal obstruction; (2) retention in the stomach; or (3) that you feel there is adequate proof that the patient has some disease that will prevent absorbing vitamins; or (4), if you want to use the administration of vitamins to keep your patient coming back. I am not saying that maliciously—sometimes you have to have a reason to get the patient back at intervals and if you want to use vitamins to obtain the patient's cooperation that may be justified. That is my attitude on vitamins.

2. Question: What is your opinion of the use of amino acid and protein hydrolysates?

Answer: Dr. Jerome Levy in Little Rock is credited with being the first man in this country fostering the use of protein hydrolysates in ulcer patients. Then Co-Tui who made Reader's Digest, claimed such remarkable efficiency for protein hydrolysates. Co-Tui had to retract some of his statements. A number of papers have appeared in the literature and there is a great deal of conflict in conclusions reached. Some feel that protein hydrolysates do have buffering action on gastric acidity; others emphatically disprove this.

Protein hydrolysates are a nutritional adjunct. We use these orally in limited amount, because they are expensive and nauseating.

When patients are in the hospital and are being prepared for surgery or have complete lack of nourishment by mouth as part of ulcer therapy we do give intravenous protein hydrolysates cautiously because most of the products available result in unpleasant reactions. We have found Parenamine (Winthrop) the most efficient preparation. It can be given in a reasonable period of time without reaction. We favor it to replace infusions as a part of ulcer management.

We have found that the reactions to intravenous amino acid can be ameliorated or prevented entirely by using benadryl before infusions or along with them.

Dr. D. N. Silverman (New Orleans): I think our knowledge of cause and treatment of peptic ulcer may go back to the very thorough study of pathology of the disease by Bress. We can understand from his studies why it is so difficult to treat an ulcer which is a lesion that has at the same time such chronic inflammatory degenerative and proliferative pathology. All too often we have thought we have cured such an ulcer and have found at operation and autopsy most of these lesions, in a stage of remission and apparently cured by radiologic examination, were still active ulcers. In newer observations I have found that it is most surprising that there are so many so-called silent ulcers. These observations have come about as a result of the study of our dysenteries, amebic and bacillary. Such cases did not yield completely to treatment in the sense of receiving remissions of symptoms or cure of the disease apparent. On further investigation of several such cases of amebic and bacillary dysentery we found the reason for failure of cure was presence of so-called peptic ulcer, silent as far as symptoms were concerned before and during the treatment for the dysentery.

With reference to treatment for dysentery I think as Dr. McHardy and Dr. Brown have brought out we have to be very judicious and careful about use of drugs. That applies to new drugs in the treatment of gastrointestinal disease. We have observed in several patients examined previously without evidence of ulcer, radiologically, after administration of certain antiamebics or

amebicides, these patients presented upper abdominal symptoms ordinarily attributed to ulcer and showed on radiologic examination gastric ulcer which they did not present before dysentery.

## CONGENITAL MALROTATION OF THE MIDGUT IN INFANTS

REPORT OF FOUR CASES

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NEW ORLEANS

Malrotation of the midgut of the intestinal tract in infants is amenable to surgery. The condition, however, is relatively rare. About 225 cases have been reported in the world literature, and Cohen states that in 6,000 births at the New York Jewish Maternity Center there were only 6 cases.

A review of the development of the gastrointestinal tract in the embryo discloses how any defect in the normal pattern could produce symptoms and even death if proper surgical therapy is not instituted quickly and adequately.

### EMBRYOLOGY

From the sixth to the tenth week of embryonic life the alimentary tube grows at a faster rate than the celomic cavity. The growth of the liver and midgut soon fills the intra-abdominal space and the midgut is forced into the root of the umbilical cord as a temporary umbilical hernia. At the tenth or eleventh week, the peritoneal cavity grows at a greater rate than the gut and the midgut is withdrawn into the abdomen. As the return begins the proximal coils of the small intestines are reduced first, and behind the superior mesenteric artery, while the cecum returns last, and it and the transverse colon come to lie in front of the mesenteric vessels. As the midgut recedes into the abdomen it rotates in a counterclockwise manner; a 270 degree counterclockwise rotation takes place. The terminal ileum, cecum, ascending colon, and proximal half of the transverse colon at first lie wholly in the left side of the abdo-

men, but after this rotation takes place they come to lie in their normal positions. The cecum and ascending colon develop their peritoneal attachments and reflections to the right abdominal wall and the mesentery of the small gut becomes attached to the posterior abdominal wall, obliquely downward from the left upper quadrant to the right lower quadrant. Thus the normal rotation of 270 degrees is completed.

### ETIOLOGY

Any defect in this rotation will give rise to abnormalities which are characterized by (1) an incompletely rotated cecum, (2) a lack of attachment of the mesentery along the posterior abdominal wall, or (3) a completely rotated cecum which is mobile and unattached.

If the cecum has not completed its rotation it is usually found in the right upper quadrant with bands of adhesions reflected from it to the right posterior abdominal wall, across the descending duodenum. These may be taut enough to give symptoms of high intestinal obstruction. If the cecum has proceeded slightly farther in its rotation it may lie directly on the duodenum and cause symptoms by direct pressure.

Associated with this malposition of the cecum is the fact that the mesentery of the small bowel does not have its usual fixation to the posterior abdominal wall, but has only a very short rudimentary attachment just below the origin of the superior mesenteric artery. The entire midgut may twist around this stalk and a volvulus of the entire midgut results. When this occurs it is usually in a clockwise fashion and may be from one to four complete turns. This condition, when it exists, is most dangerous and urgent, as not only obstruction has to be dealt with but infarction of the entire midgut may occur.

### DIAGNOSTIC POINTS

Over half of the cases of malrotation produce symptoms before the third week of life; however, the condition may remain silent for some time and produce symptoms later in childhood. These symptoms are much like those of coeliac disease, and a barium enema is necessary for diagnosis.

The clinical picture usually seen with



duodenal obstruction from congenital bands is persistent vomiting, and the vomitus contains bile. Abdominal distention is present and in the early phases is limited to the epigastrium, but later may be generalized due to fermentation beyond the obstructed duodenum. The child may have scanty stools as the obstruction is usually incomplete. Dehydration and fever are present if the child has not been treated with parenteral fluids.

X-rays of the abdomen show a dilated stomach and duodenum and only a few air bubbles in the remainder of the abdomen. Later the entire small gut may show dilatation. It is not necessary to use a contrast media to confirm the diagnosis, but if a barium meal is given a small amount of a thin mixture should be used so if regurgitation occurs the chances of aspiration pneumonia are lessened. The barium will usually advance to the obstructed portion of the duodenum and only a small amount will pass beyond this point. A barium enema will show the cecum in the epigastrium if malrotation is present.

Laboratory studies will show hemoconcentration, a high white blood count and a concentrated urine. An extremely high white blood count should lead one to suspect infarction of the midgut.

The conditions most often confused with malrotation are atresia and stenosis of the bowel and sometimes pyloric stenosis. As all of these are surgical emergencies no time should be lost for differential diagnostic purposes, and as soon as the diagnosis of obstruction is made laparotomy should be completed.

#### TREATMENT

The patient should be well hydrated and the electrolytic balance returned with glucose and saline. In emaciated patients small transfusions of whole blood are of great aid. A small gastric tube should be passed through the nose into the stomach before surgery.

The abdomen should be opened through a long paramedian incision extending from the xyphoid to below the umbilicus. If duodenal obstruction exists the ascending

and transverse colon will present as the abdomen is opened and inspection will reveal the duodenal obstruction to be caused either by direct pressure of the cecum or by congenital bands running from the cecum, over the anterior duodenal surface, to the right posterior abdominal wall, and thus causing the obstruction. This condition is cured by an operation devised by Ladd. The right posterior parietal peritoneum is divided just to the right of the cecum until the entire duodenum is cleaned anteriorly and the cecum is mobilized so it may be placed in the left upper quadrant. This is sufficient to correct the condition and the abdomen is closed.

If a midgut volvulus is present, coils of reddish blue small gut will be present when the abdominal cavity is entered and the right half of the colon will not be visible. The entire small gut must be delivered from the abdominal cavity and the volvulus reduced by rotating the entire small gut, usually in a counterclockwise direction, enough times to reduce the twist. After this the cecum will lie in the right upper quadrant, and it is very important to sever its lateral peritoneal attachment and place the cecum and ascending colon in the left side of the abdomen. The entire bowel should be inspected for other anomalies.

The anesthetic of choice in these cases has been found to be open drip ether, with oxygen being administered by nasal catheter during the entire procedure.

The following case histories from the Independent Surgical Service at the Charity Hospital of Louisiana in New Orleans exemplify the above.

#### CASE REPORTS

*Case No. 1.* A seven month premature colored male, spontaneous delivery. Postnatal examination revealed no abnormalities. Child was placed in the nursery for premature infants and routine care started. It was noted that the patient vomited after practically every feeding. The vomitus was often bile stained. All oral feedings were stopped for three days, fluid balance being maintained by clyses, intravenous fluid, and blood transfusion. A small catheter was passed into the stomach and a small amount of thin barium was injected into the stomach. X-ray and fluoroscopy showed the stomach and first portion of the duodenum to be markedly dilated and only a trickle

of barium was seen to enter the small gut. A three hour plate showed approximately 75 per cent gastric retention with a small amount of barium in the terminal ileum.

At operation, the cecum and ascending colon were in the epigastrium just inferior to the greater curvature of the stomach. Division of many thin vascular bands passing from the right upper posterior peritoneal mass across the descending duodenum to the cecum relieved the obstruction, and gas was seen to pass into the small gut. Inspection revealed no other gross anomalies. The abdomen was closed in layers with interrupted black silk #000.

For the first four postoperative days the child continued to vomit, but after that time retained all feedings and began to gain weight. The remainder of the postoperative course was uneventful.

This was a case of duodenal obstruction by congenital bands due to malrotation of the midgut which responded to surgical therapy.

*Case No. 2.* A nine day old colored male, with a chief complaint of jaundice and vomiting. He had vomited since his first feeding and for three days prior to admission had vomited not only after feeding but many times between feedings.

Physical examination revealed an emaciated, dehydrated infant with a distended abdomen and normal peristalsis.

*Laboratory:* Hemoglobin 13.3 gm. or 90 per cent; RBC 5,000,000; WBC 20,000; polys. 68; lymphocytes 32; no normoblasts; no erythroblasts; Prothrombin time, 100 per cent of normal. Kahn and Kline negative. Urine: albumin negative; sugar negative; acetone negative. Trace of urobilinogen. Ceph. flocc. 2-3; van den Bergh-31.4; icteric index, 133. X-ray of abdomen showed marked distention of bowel with fluid levels in upper left quadrant.

*Hospital Course:* Given intravenous dextrose and saline on admission; nothing per os ordered. Could tolerate only small amounts of water by mouth after three days. Again started vomiting and abdomen became distended. Thick feedings were started and child vomited only once in twenty-four hour period. No stools since admission. Abdomen markedly distended. Under open drip ether the abdomen was opened through a right paramedian incision. As the peritoneum was opened, dilated loops of bluish red small gut presented. A volvulus of the entire small intestine was found consisting of two complete twists ( $720^\circ$ ). This was reduced and a mobile cecum was found. On inspection of the gut two gangrenous plaques were found in the midjejunum. This area was resected and a side-to-side anastomosis was done with two rows of interrupted quilting cotton. The abdomen was closed in layers with interrupted quilting cotton.

The patient was given intravenous fluid, blood, and sulfadiazine by clyses. The temperature con-

tinued to rise, pneumonia developed, and patient expired on the third postoperative day. The pathology report on the resected gut was "moist gangrene of gut; stricture of gut due to chronic granulation tissue".

This case represents malrotation with a mobile, unattached cecum, and resulting volvulus of the small gut which caused infarction and gangrene. The pathology report of "stricture due to granulation" was due to the fact that the infarcted area had probably been present since admission and had begun to granulate. Death was due to peritonitis and pneumonia. The jaundice was explained by the postmortem finding of fibrosis of the pancreas.

*Case No. 3.* A ten day old colored female infant, who had been vomiting since birth presented a volvulus of the entire small bowel at operation. Following reduction of volvulus the normal color returned to the bowel. The cecum and ascending colon were allowed to remain in the left side.

Patient developed a severe diarrhea on the seventh postoperative day but recovered. In contrast to Case No. 2, early surgery was successful.

*Case No. 4.* A four day old white male, admitted December 19, 1947, with a chief complaint of vomiting all feedings since the first twenty-four hours. *X-ray of chest and abdomen:* "Suggestive atelectasis involving right upper and right middle lobes, with emphysema of left lung. Stomach gas bubble well demonstrated. There is only one other gas bubble just to the right of the spine. Findings are compatible with duodenal obstruction." *Hospital Course:* Patient put on penicillin, clyses, intravenous fluid and blood transfusion. *Repeat X-ray (one day later):* "Clearing of rt. sided pneumonia. Abdominal findings unchanged."

Under drip ether and oxygen, the entire small bowel was delivered onto the abdominal wall and was found to have a 90 per cent twist on its meso. The cecum and appendix lay on the duodenum in the right upper quadrant attached by bands extending to the right lateral peritoneal gutter and obstructing the duodenum at this point. The bands were severed and the cecum moved to the left upper quadrant.

Patient vomited intermittently for several days, then began to retain all feedings well.

This case illustrates obstruction of the duodenum by congenital bands, plus an early volvulus of the small gut.

#### CONCLUSIONS

1. The embryology, etiology, diagnostic points, and treatment of congenital malrotation of the midgut have been briefly reviewed.

2. This is one of the congenital conditions which carries a good prognosis.

3. Early diagnosis and treatment are essential. The diagnosis can usually be made



from the history, physical examination, and regular EPA x-ray of the abdomen.

4. The case histories of four patients seen at Charity Hospital, of Louisiana in New Orleans, in the past five years are presented.

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## THE CHANGING PICTURE IN APPENDICEAL DISEASE

A FIFTEEN YEAR SURVEY  
AT TOURO INFIRMARY\*  
GERALD N. WEISS, M. D.†

NEW ORLEANS

In March, 1934, Dr. Urban Maes delivered a paper on acute appendicitis before the Orleans Parish Medical Society in which he stated:

"... the death rate ... is almost as high today as it was nearly fifty years ago when Fitz, the internist, first described appendicitis as a surgical entity and Morton, the surgeon, first deliberately operated for it."

Despite the early excellent monographs of Kelly,<sup>2</sup> Deaver,<sup>3</sup> and Battle,<sup>4</sup> and the introductory classical articles by Fitz,<sup>5</sup> McBurney,<sup>6</sup> Murphy,<sup>7</sup> and other renowned surgeons, the mortality of appendicitis was at a record high of 15.2 per 100,000 population in 1930.<sup>8a</sup>

Within recent years, however, the mortality of this disease has fallen to 2.9 per 100,000 population in this country.<sup>8d</sup> Current articles,<sup>9-11</sup> indicate that the antibiotics, gastrointestinal tubal decompression, simplified and adequate methods for par-enteral fluid and blood administration,

early ambulation and the like, have contributed greatly to this decline in mortality. Equally as important as, if not more important than, all of these factors concerned with improved hospital care of the patient is the fact that the physician and the lay public are becoming aware of the grave situation created by delay in treatment of appendiceal disease. The continuing programs instituted in such cities as Philadelphia<sup>12</sup> and Cleveland,<sup>13</sup> and transient programs in New Orleans<sup>14</sup> and other cities have resulted in this education of the laity.

With the statistical picture in appendicitis greatly improved, a thorough analysis of the condition during the past fifteen years at Touro Infirmary leads one to feel that constant vigilance must be maintained and the latest facts reviewed to understand the changing picture in appendiceal disease. The fundamentals remain unchanged, but a new surgical generation is growing up that sees appendicitis as an almost benign disease; that sees only the great decrease in its mortality and overlooks its seriousness, a seriousness that was forced upon the older surgeon by the high fatality rate.

Appendiceal disease is no longer the medical problem of years ago, but it still merits periodic analyses and study. The trend in medical literature is clearly evident, as seen in the *New Orleans Medical and Surgical Journal*. Between the years 1934 and 1944, in this journal there appeared 26 articles (1, 14-38) concerned with the problems of appendicitis. In the following years there has been but 1 paper concerned with appendiceal disease and this dealt with a rare entity, carcinoid of the appendix.<sup>39</sup> The time is certainly ripe for another discussion of the subject, not only within medical circles but also among the lay public. Statistics continue to reveal that a degree of unawareness still exists among both medical and lay groups. Boyce<sup>40</sup> has recognized this in his current book on acute appendicitis, in which he says:

"Most of the deaths from acute appendicitis originate outside of the hospital and the surgeon, though he bears the greater responsibility, has the least to do with them, since the mortality is determined above everything else by the proportion

\*Presented at meeting of the Orleans Parish Medical Society, February 13, 1950.

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of patients admitted with appendices already ruptured."

In the case of the general practitioner, it is time to re-emphasize the statement of Osler,<sup>41</sup> that one

"... does well to remember—whether his leanings be toward the conservative or radical methods of treatment—that the surgeon is often called too late, never too early."

#### CLASSIFICATION

The varied classifications of appendiceal disease have been responsible for a wide range of statistics concerned with mortality due to appendicitis. There has been no absolute classification, but the one recommended here has been prepared after reviewing the proved cases. These cases were confirmed by the pathologist's analysis of specimens removed either at the operating or on the autopsy table. Appendiceal disease at Touro Infirmary is coded in accordance with the system recommended by the American Medical Association in *Standard Nomenclature of Disease*.<sup>42</sup> The following classification seems to be most in accord with clinical application:

#### I. Appendicitis

##### A. Acute

1. Without complication
2. With complication
  - a) Gangrene
  - b) Abscess
  - c) Perforation

##### B. Chronic

1. Recurrent, active or inactive types
2. Inactive or asymptomatic (incidental to other surgery)

#### II. Miscellaneous types of appendiceal disease

- A. Appendicopathia oxyurica
- B. Carcinoid
- C. Endometriosis
- D. Tuberculosis
- E. Adenocarcinoma
- F. Other Types

#### INCIDENCE

Appendiceal disease of all types is common. It constituted an average of 7.5 per cent of the 190,487 admissions to Touro Infirmary in the years 1934 through 1948. Of over 49,000 patients admitted to the general surgical service during this period, 17

per cent had proved appendiceal disease. Figure 1 illustrates the incidence of the

#### APPENDICEAL DISEASE - TOURO SERIES INCIDENCE OF TYPES 13,374 cases

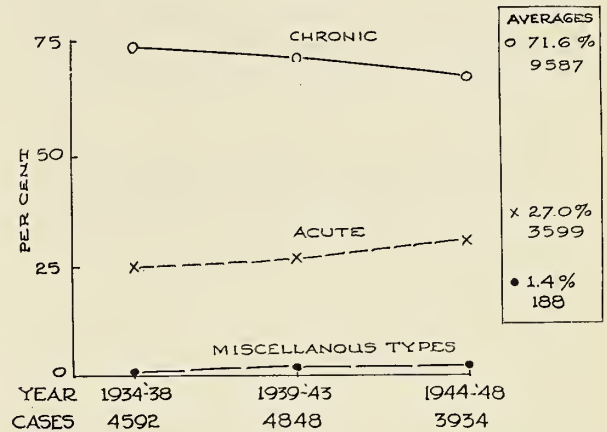


Fig. 1. Incidence of Types of Appendiceal Disease in 13,374 Cases (Touro Series)

types of appendiceal disease. Once almost three-fourths of the cases of appendiceal disease were chronic in nature. Now only two-thirds of all the cases fall into this group. Correspondingly, the incidence of acute appendicitis has risen proportionately from one-fourth to almost one-third. Miscellaneous types averaged less than 2 per cent of the total series.

The over-all mortality rate in 13,374 cases of proved appendiceal disease in the fifteen year period at Touro Infirmary was 0.7 per cent or 92 deaths. Figure 2 illus-

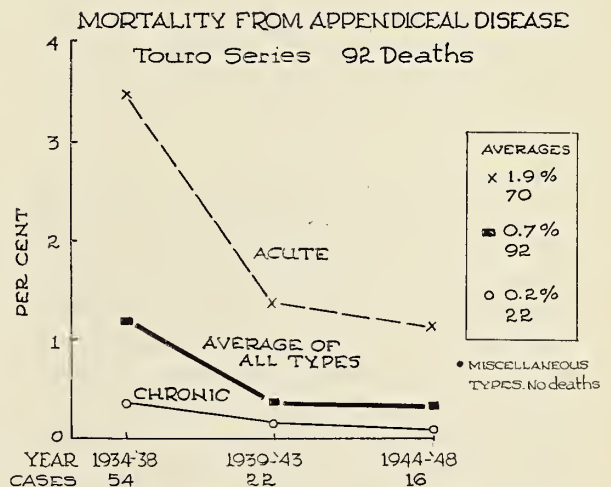


Fig. 2. Mortality from Appendicitis (Touro Series)



trates a reduction of two-thirds in the mortality of the disease in the five year period 1944 through 1948 as compared with the period 1934 through 1938. This reduction corresponds to that reported during the same period at other medical centers throughout the country and as reported by the National Office of Vital Statistics<sup>8</sup> (Fig. 3).

MORTALITY FROM APPENDICITIS  
According to National Office of Vital Statistics

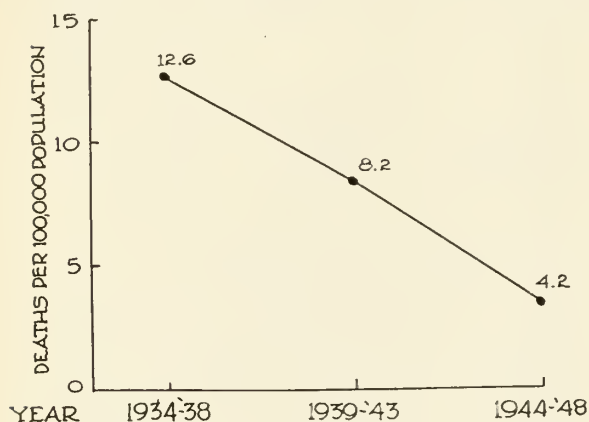


Fig. 3. Mortality from Appendicitis (National Office of Vital Statistics)

The necessity of classification into standard subgroups in the reporting of incidence and mortality statistics for appendicitis, which is not generally observed, is quite emphatically revealed in a study of this sort. For example, the mortality for appendiceal disease of all types was the result in about 40 per cent of the cases of acute appendicitis with perforation, a condition present in less than 2 per cent of the total series.

If appendicitis statistics are to be accurate, they must be classified, particularly with reference to the proportion of cases of perforation included in a series of acute appendicitis. Ochsner, Gage, and Garside, in 1930,<sup>43</sup> presented a table of comparisons showing that Clairmont and Meyer in a series of 1,594 cases had a mortality of 3 per cent whereas in the 193 cases in the authors' Charity Hospital of Louisiana series the mortality was over 20 per cent. The principal reason for this great discrep-

ancy is the fact that in the first series of acute appendicitis only 0.24 per cent of the patients had diffuse peritonitis, whereas in the Ochsner *et al* series the percentage was 11.9. When evaluating statistical analysis of acute appendicitis, it is obvious that the proportion, as well as the respective mortality of each type of acute appendicitis must be specified.

#### ACUTE APPENDICITIS

The 3,599 cases of acute appendicitis observed in the fifteen year period at Touro Infirmary carried a mortality of 1.9 per cent. Of course, in recent years the mortality figure has been much lower than the average; for example, during 1948, in 281 cases there was a mortality of only 0.7 per cent. In comparing the three five year periods (Fig. 4), it is clear that acute ap-

INCIDENCE OF TYPES ACUTE APPENDICITIS  
Touro Series-3599 cases

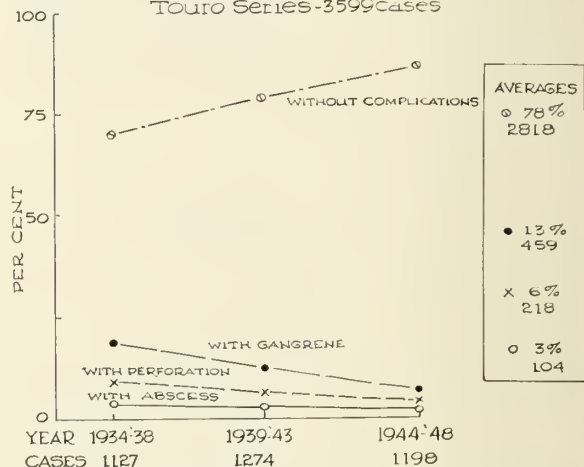


Fig. 4. Incidence of Types of Acute Appendicitis in 3,599 Cases (Touro Series)

pendicitis without complication has increased from 70 to almost 90 per cent of the cases. Even more important is the fact that the incidence of gangrene, abscess, and perforation has fallen in the same proportion. This would indicate that earlier more accurate diagnosis and treatment is being instituted in appendicitis.

Boyce's series of 6,441 cases from Charity Hospital of Louisiana at New Orleans can be compared with the 3,599 cases observed at Touro Infirmary in which more

private than indigent cases are seen (Table 1). It can readily be recognized that the

TABLE 1  
ACUTE APPENDICITIS

CHARITY SERIES—6441 CASES 1930-1945 Types	TOURO SERIES—3599 CASES 1934-1949			
	Per Cent of Cases		Per Cent of Mortality	
	Charity	Touro	Charity	Touro
Without Complication	51	78	0.6	0.4
With Gangrene	23	13	5.0	3.3
With Abscess	7	3	13.0	7.0
With Perforation	19	6	14.0	17.0
			5.0	1.9

5 per cent mortality in the Charity Hospital series is attributable primarily to the greater percentage of patients seen with the complications of acute appendicitis, notably perforation. This fact serves to emphasize the need of education of patients in the lower economic groups who are being seen late in the course of appendicitis. A campaign to educate these groups might bring the mortality of the charity and of the private institutions to a more equal standing.

Although the incidence of complications and mortality in the Touro series has been reduced greatly, an analysis of the deaths shows many significant facts (Table 2). Over one-half of the deaths from acute appendicitis are now occurring in the age group over 40. Procrastination and purgation are still the principal factors contributing to death. Peritonitis remains the primary cause of death in over three-fourths of the cases. Over one-third of the patients who died gave a history of at least one previous attack.

In examining the problem of delay more closely, it is noted that in the 70 deaths from acute appendicitis, almost one-third of the histories revealed delay of over twenty-four hours by the patient and a somewhat greater percentage delayed on advice of a physician. In one-sixth of the cases the reason for delay was not specified, although 19 per cent of the total patients were from out of town and difficulty in transportation perhaps was a factor. The small remaining group of patients applied for treatment within the twenty-four hour

period. Fifteen years ago, Maes<sup>22</sup> reported an almost equal proportion of deaths (i. e. 79 per cent) with a delay of over twenty-four hours in treatment. Procrastination, therefore, as in years past, is still the primary contributing factor in death from appendicitis. Delay by the patient definitely shows lack of knowledge of the disease, and perhaps in some cases can be attributed to difficulty in transportation. But why in over one-third of the 70 deaths was there delay by the physician? Either the physician did not diagnose the disease correctly, or he did not recognize it as an acute surgical emergency. Certainly, all physicians should be aware of the facts as stated by Murphy:<sup>7</sup>

"From the symptoms and clinical course of the disease in the first forty-eight hours it is impossible to predict with any degree of certainty, what the course of the case will be . . ."

It is mandatory, therefore, when the diagnosis of acute appendicitis is made, or cannot be safely ruled out, that early surgical therapy is indicated, for the danger in delay is far more serious than the appendectomy. And now, almost one-half a century since Murphy's classic article on appendicitis, one too must conclude as did he:

"It seems to me that every death from appendicitis is chargeable directly to the people, either for not calling in the physician sufficiently early after the onset of symptoms, or to the physician and surgeon for not acting promptly when called. I am sorry to admit that the latter represents the greater percentage . . ."

One is tempted to question at this point, would not deaths from acute appendicitis be less common if the incidence of the treatment of chronic recurrent appendicitis had not fallen? In any event, 37 per cent of the patients who died gave a history of at least one previous attack (Table 2). It is probable that interval appendectomy would have saved these patients.

Purgation, too, remains a major factor responsible for deaths from appendicitis. In Maes' series<sup>22</sup> 49 per cent of the patients who died were reported to have taken laxatives. In the present series, 27 per cent, or over one-fourth took a purgative with the attack. Some improvement can be recorded in reference to this aspect of the



TABLE 2  
DISTRIBUTION AND MORTALITY OF 3599 CASES OF  
ACUTE APPENDICITIS AT TOURO INFIRMARY  
1934-1948

	Without Complication	Gangrene	With Complication Abscess	Perforation	Total Cases	Per cent of Total
Total Cases	2818	459	104	218	3599	.....
Total Deaths	11	15	7	37	70	100
Sex: Male	5	12	4	22	43	61
Female	6	3	3	15	27	39
Age under 13	1	0	1	7	9	13
13-39	3	3	2	14	22	31
Over 39	7	12	4	16	39	56
Out of town	2	2	2	7	13	19
Onset less than 24 hrs.	6	4	0	4	14	20
over 24 hrs.	5	11	7	33	56	80
Previous Attack	6	4	5	11	26	37
Laxative with Attack	1	4	0	14	19	27
Enema with Attack	2	3	0	3	8	11
Delay over 24 hrs.						
Patient	5	3	2	10	20	28
Physician	1	2	5	17	25	36
Unspecified	0	6	0	6	12	17
Failure of diagnosis on hospital admission	2	3	5	13	23	33
Surgery Yes	10	15	6	26	57	81
No	1	0	1	11	13	19
Peritonitis at surgery						
Localized	0	8	4	5	17	30
Generalized	2†	7	3	21	33	58
Peritoneal Drainage	0	3	6	21	30	53*
Incisions						
Deaver	3	9	3	10	25	44
McBurney	4	4	0	9	17	30
Battle	1	1	0	5	7	12
Midline	1	1	1	0	3	5
Transverse	1	0	0	2	3	5
Kidney	0	0	1	0	1	2
Left Paramedian	0	0	1	0	1	2
Anesthesia						
General	6	11	3	20	40	70
Spinal	4	4	2	5	15	26
Local	0	0	1	1	2	4
Deaths from Peritonitis and Complications	4	7	7	37	55	79
Other Causes	7	8	0	0	15	21

†Technical error at time of surgery resulting in generalized peritonitis

\*Percentage of the 57 operative cases

problem. It is clearly evident, however, that the lay public is still not sufficiently educated to the danger of the use of laxatives or high enemas with abdominal pain.

The principal cause of death from acute appendicitis continues to be peritonitis. Fifty-five of the 70 deaths, or 79 per cent of the cases, died with this terminal complication. The last local report on the mortality of acute appendicitis,<sup>14</sup> fifteen years

ago, revealed a comparable mortality.

It is interesting to examine the reason for failure to operate in one-fifth of the deaths due to acute appendicitis (Table 2). In the 13 cases not treated surgically, the omission of operation was due in 7 cases to error in diagnosis by the physician, in 3 cases to the institution of conservative therapy, and in the remaining 3 cases to refusal of surgery by the patient. In 8 of

these cases, well over half, the patients were in the age group over 40 and atypical symptomatology made diagnosis difficult.

Figures gathered in this series of deaths as to the type of anesthesia, incision, and drainage do not in themselves prove to be illuminating. The consensus of current literature<sup>13, 40, 44</sup> is toward a preference for spinal anesthesia, anatomicophysiologic incisions (McBurney or transverse), handling of the appendiceal stump by purse string inversion with or without ligation, and less frequent drainage of the peritoneal cavity since the advent of antibiotics.

#### CHRONIC RECURRENT APPENDICITIS

Coded under chronic recurrent appendicitis were 9,587 cases with a mortality of 0.2 percent. During the past ten years there has been a steady decline in the number of these cases, so that during the period 1944 through 1948, only slightly more than two-thirds of the cases of appendiceal disease were thus classified.

It became obvious in reviewing the deaths classified and coded according to the hospital requirements as chronic recurrent appendicitis, that two distinct groups existed. Appendices might be removed and sent to the pathologist with a clinical diagnosis of chronic recurrent appendicitis, while others might be removed incidentally in the course of another abdominal procedure. Both appendices would show similar pathology and so a diagnosis of "chronic appendicitis" would be reported by the pathologist. The resident staff, in completing the patient's record, sign out all such cases as chronic recurrent appendicitis, as no provision is made for the category of chronic appendicitis, asymptomatic or inactive. No attempt was made to analyze these cases closely; but a study of the deaths was made and in one-half of the 22 fatalities indexed as chronic recurrent appendicitis a concomitant surgical procedure was found to have been performed. The 11 deaths following appendectomy alone were attributable in 5 cases to peritonitis, in 3 cases to pulmonary complications, and in 1 case each to septicemia, coronary disease, and mesenteric thrombosis.

It would seem that some of these deaths might have been prevented. In 2 instances had an incision of more than 2½ inches been used, difficulties and subsequent death might have been avoided. These deaths serve to emphasize that although the fatality rate for chronic recurrent appendicitis has recently been reduced to less than 1 in 1000 cases (Fig. 2), no operation can ever be regarded lightly or performed in a compromising fashion.

The remaining deaths in which the appendix was removed and found to be chronically diseased were associated with the following conditions and additional surgery: 6 cases with gallbladder disease, 3 cases with hysterectomy, and 1 case each of intestinal obstruction and tubal sterilization. Incidental appendectomy in no case was the primary cause of death in these instances.

It is exceedingly rare that incidental appendectomy is responsible for an operative or postoperative fatality. On the other hand, there are many cases in which, if the surgeon while operating within the abdominal cavity would practice prophylactic surgery, the patient might be spared another operation or even saved from death.

#### MISCELLANEOUS TYPES OF APPENDICEAL DISEASE

There were 188 cases classified in the category of miscellaneous types of appendiceal disease, without a death. Over half of the cases were oxyuriasis of the appendix or so called "appendicopathia oxyurica".<sup>45</sup> Next in order of frequency were the carcinoids (15 per cent), endometriosis (10 per cent), tuberculosis (4 per cent), and adenocarcinoma (4 per cent). The remaining 15 per cent of the total were divided among the following diseases: helminthiasis, diverticulum, mucocoele, foreign body, ascariasis, intussusception, transposition, congenital absence, carcinoma, neuroma, and neurofibroma.

It is interesting that in this period there was not a single death from miscellaneous types of appendiceal disease, since all of them occurred with either acute or chronic appendicitis.

#### SUMMARY

The incidence of hospital admissions to Touro Infirmary of New Orleans for appen-



diceal disease was 7.5 per cent of 190,487 admissions in the fifteen year period 1934 through 1948.

The mortality for appendiceal disease has fallen by two thirds with an average fatality rate in 3,374 cases of 0.7 per cent, or 92 cases.

In the series of 3,599 cases of acute appendicitis there was a death rate of 1.9 per cent. Approximately:

1 in 250 patients died of acute appendicitis without complication.

1 in 30 patients died of acute appendicitis with gangrene,

1 in 15 patients died of acute appendicitis with abscess, and

1 in 6 patients died of acute appendicitis with perforation.

In the series of 9,587 cases with chronic appendicitis, both recurrent and those removed incidental to other surgical procedures, the mortality was 0.23 per cent, or approximately 1 in 430 patients died.

Although earlier more accurate diagnosis and treatment are being instituted in appendicitis, mortality is due in great part to the same factors which were responsible in years past, procrastination and purgation.

Interval appendectomy for patients with a history of one or more attacks of appendicitis, and appendectomy where feasible during the course of other intra-abdominal operations will aid in reducing mortality from appendiceal disease.

Periodic analyses of the problem of appendiceal disease are indicated and should be presented to medical and lay groups at regular intervals.

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## DISCUSSION

Dr. Urban Maes (New Orleans): In May 1936, the Orleans Parish Medical Society put on, as a part of its program, what they chose to call "Longer Life Week". This was part of an educational program which was contemplated as an annual feature. The subject at that time was acute appendicitis and brief talks were made at hospitals, schools, clubs, and other gatherings, and special emphasis was laid on the dangerous administration of purgatives in acute abdominal conditions. I was asked to be the chairman of the committee and used as a slogan—procrastination and purgation were the two greatest factors in the death rate from acute appendicitis. These points have been brought to our attention again in this statistical study by Dr. Weiss.

At that time we analyzed 1848 cases collected from several hospitals and found the overall death rate to be 5.8 percent or 107 deaths in 1848 patients. In this series the death rate when purgatives had been administered was over 10 per cent or nearly double. The time element also played an important part. When patients were cared for in the first twenty-four hours, the death rate was 2.1 per cent, whereas at the end of twenty-four hours the rate was 8.7 per cent, and when forty-eight hours had elapsed the rate was 11.7 per cent. Our figures regardless of the time element show that a person who has taken a purgative is twice as likely to succumb. The purgative had been ordered by the physician in only 10 patients.

Dr. Weiss has shown by his figures that the death rate has been reduced by two-thirds, and in

analyzing his records the complications also have been materially reduced. There are three obvious reasons for this salvage:

1. Earlier treatment is noticeable.
2. The withholding of purgatives is noteworthy.
3. The use of antibiotics has reduced the incidence and helped the control of peritonitis.

It may be that the educational program did some good and the laity has shown more wisdom in the indiscriminate use of purgative for acute abdominal pain. This and earlier operation even in doubtful cases has undoubtedly saved many lives.

Acute appendicitis is not a dangerous disease when the disease process is confined to the lumen of the appendix. It is only when rupture, gangrene, or perforation have occurred that acute appendicitis becomes a dangerous disease. In other words, the complications that kill are extra-appendicular. The remedy is obvious.

It is interesting to note that Dr. Weiss reviewed 27 papers on this subject published in the last fifteen years, and 26 of these are over ten years old.

Probably the educational program did some good.

## CARDIAC PREDECOMPENSATION\*

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Under the term *cardiac predecompensation*, I shall include two types of cases: (1) Persons with organic heart disease, who have no symptoms or signs of decrease of myocardial reserve; and (2) persons with heart disease who have symptoms and signs due to cardiac dysfunction but who as yet have not developed frank heart failure.

The first category is of particular importance to the general practitioner, for this is the group in which heart disease is discovered as an incidental finding in patients who visit the physician for a general check-up or for the relief of unrelated complaints. Although, as a general rule, patients with asymptomatic heart disease require no treatment directed at their heart disease, it is important that such patients be examined at intervals so that incipient cardiac decompensation may be recognized in its earliest stages, and in certain cases something can be done about the heart disease as such. For example, in syphilitic heart disease, which on occasion may be

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picked up in the early stages, when one hears an accentuated aortic second sound or an aortic diastolic murmur, careful and thorough antisyphilitic treatment may prevent further progression of the lesions so that heart failure may be entirely prevented.

Again, certain asymptomatic congenital anomalies, such as coarctation of the aorta and patent ductus arteriosus, if recognized in childhood, may actually be cured by surgical measures, and the cardiovascular system restored practically to a normal state.

Hypert thyroidism, myxedema, and diabetes, conditions which may eventually cause heart disease and heart failure, may be prevented by proper treatment, and anemia and vitamin B deficiency are other examples of conditions which affect cardiac function and which are readily amenable to treatment.

Hypertensive heart disease in the stage of predecompensation is less amenable to treatment because certain effective measures for the control of hypertension have not as yet been discovered, but in some cases it may be possible to reduce the blood pressure and thus decrease the burden of the heart.

Constrictive pericarditis, which produces a very definite and easily recognizable syndrome, is amenable to surgical treatment, but such treatment is usually not indicated unless severe symptoms have resulted from compression of the heart.

It behooves the general practitioner, therefore, to be familiar with the symptoms and signs of these conditions in their pre-symptomatic stages, so that if possible the patient may either be removed from the category of cardiac predecompensation or remain in this category indefinitely and never develop frank cardiac failure. We shall, however, spend most of our time today discussing the recognition and treatment of the earliest stages of cardiac insufficiency, stages in which therapy is usually quite effective, so that if treatment is begun at this time, frank cardiac failure may be prevented for many years or even

indefinitely. Again, patients with such early cardiac decompensation are usually seen first by the general practitioner, as indeed are patients with most diseases and conditions in their earliest stages, so that the responsibility for prolonging the useful lives of these individuals falls principally on him.

The great majority of patients in this category of cardiac predecompensation will be middle-aged or elderly individuals with hypertensive or arteriosclerotic heart disease; a small number will have rheumatic heart disease, and an even smaller number heart disease of other etiology.

#### SUBJECTIVE SIGNS

The subjective symptoms of early or mild decompensation are due principally to two causes:

1. Decrease of cardiac output, which results in subnormal blood flow through the body, and which in the early stages is manifested principally by easy fatigability, muscular weakness, and sometimes by cerebral symptoms such as dizziness, inability to concentrate, nervousness, and irritability. These symptoms are especially apt to appear in the afternoon or evening, after the ordinary activities of the day, for in most patients with early cardiac failure the cardiac output is not greatly reduced below normal at rest.

2. Passive congestion, due to backward failure and increase of blood volume, is manifested principally by dyspnea on exertion, upper abdominal discomfort—especially marked after meals, slight enlargement of the liver, slight or moderate distention of the neck veins, and in some cases puffiness of the feet and ankles toward afternoon.

There is considerable variation in the subjective complaints of patients with incipient cardiac failure. Some will complain only of easy fatigability and indigestion, for example; others will have as their chief complaint right upper quadrant pain related to congestion of the liver; still others will complain of dyspnea on exertion. Since all of these complaints may be due to factors other than diminution of myocardial

reserve, determination of their exact pathogenesis is a matter of great importance.

#### OBJECTIVE SIGNS

In such an evaluation, one must rely almost entirely upon objective data, of which the most important by far are physical signs and x-ray signs. Of these, the following are of the greatest importance:

1. Enlargement of the heart, as manifested by displacement of the apex beat or by the x-ray. For practical purposes, it may be said that the absence of cardiac enlargement practically rules out the heart as the cause of such symptoms as those which have been mentioned.

2. Signs of pulmonary congestion. The most important physical sign of pulmonary congestion is the occurrence of rales at the bases of the lungs, but it should be emphasized that rales constitute a sign of pulmonary edema, and that a significant degree of congestion may be present without the occurrence of rales. The x-ray affords much earlier evidence of pulmonary congestion, manifested by exaggeration of the lung markings, especially in the region of the hilum. The combination of cardiac enlargement and exaggerated vascular markings is practically pathognomonic of pulmonary congestion due to cardiac decompensation.

3. Other physical signs which have been mentioned, such as venous distention, palpability of the liver, and pretibial edema.

The electrocardiogram plays no part in the recognition of cardiac decompensation, since this reveals only disturbances of impulse production or impulse conduction. It should be noted in this connection, however, that certain cardiac arrhythmias, such as auricular fibrillation, paroxysmal tachycardia, and even frequent premature beats, which can usually be recognized without recourse to the electrocardiogram, may impair cardiac efficiency and may thus predispose to or aggravate incipient cardiac decompensation.

It cannot be too strongly emphasized that cardiac decompensation is not the sole cause of dyspnea in middle-aged or elderly patients. Such dyspnea is frequently due

to pulmonary or bronchial disease, and for this reason an x-ray of the chest is indicated in all patients who are short of breath. In some cases it will be found that the dyspnea is due to carcinoma of the lung or other serious pulmonary disease, while in others it will be found that pulmonary emphysema is the cause of the shortness of breath. In most cases pulmonary emphysema can be recognized without recourse to the x-ray, the principal physical sign being characteristic change in the shape of the chest. The x-ray findings are, however, quite characteristic, and in most such cases it will be found that the heart is not significantly enlarged. The history is very important, most patients with pulmonary emphysema complaining first of dyspnea on exertion, which is only very slowly progressive over the years, and which is later manifested by cough, mucopurulent or purulent sputum, wheezing, and the occurrence of attacks of wheezing dyspnea very similar to bronchial asthma.

#### TREATMENT

The treatment of cardiac predecompensation is, we may say, practically identical qualitatively with the treatment of frank heart failure, varying only in its quantitative aspects. These patients need rest and digitalization, and many of them need salt restriction and diuretics. However, rather than bed rest, they need moderate restriction of activity, with a short period of bed rest during the middle of the day, slow rather than rapid digitalization, moderate rather than drastic salt restriction, and small rather than large doses of mercurial diuretics. Cardiac arrhythmias in these cases may be controlled by slow rather than rapid quinidization. A few details regarding the employment of these methods and medicines may be in order:

1. Rest. A good rule regarding the amount of activity allowed these patients is that activity should be less than the amount which will produce signs of backward or forward failure, principally dyspnea and fatigue. If the patient experiences such symptoms, he is exercising too much, but there is good evidence that exercise



short of the amount which will produce symptoms is beneficial rather than the reverse. In most cases it will be found that after the institution of other measures, the exercise tolerance of these patients will increase, and it is always safe to allow exercise which does not reach the tolerance point. Strenuous exercise, particularly sudden, strenuous exertion, is always to be avoided.

2. Digitalis. In my opinion, digitalization is indicated for practically all patients in this category, and in many cases it will be found that restriction of activity and digitalization are the only measures which are necessary. There is no point in rapid digitalization in such cases, since no emergency is present, and since the safety of digitalis administration undoubtedly varies inversely with the speed of digitalization. As a rule, USP digitalis is preferable to any of the purified preparations, a satisfactory method of its use being to give  $1\frac{1}{2}$  gr., three times a day for a week or ten days, followed by a maintenance dose of  $1\frac{1}{2}$  to 3 gr. daily for an indefinite period of time. We have found that most patients tolerate 3 gr. a day very well, without symptoms of digitalis intoxication, and that in many patients digitalis effect is lost on the usual smaller maintenance dose of  $1\frac{1}{2}$  gr. a day.

A few patients will not tolerate therapeutic doses of USP digitalis, complaining principally of anorexia, nausea, and upper abdominal discomfort, and for such patients one of the purified preparations is indicated. In such instances digoxin or digitoxin may be used, my own preference being digoxin because of its more rapid elimination and therefore the lesser likelihood of prolonged manifestations of digitalis toxicity. If digitoxin is used, it should be remembered that the ordinarily recommended digitalization dosage of 1.2 mg. is too small for most patients, while on the other hand the recommended maintenance dosage of 2 mg. is usually too large, so that a considerable number of patients will develop signs of intoxication after they have been taking this amount for more than a few weeks.

3. Salt restriction and diuretics. I think it is important to point out that measures which reduce the salt content of the body are valuable only in the control of passive congestion, and that they are therefore not indicated in patients whose symptoms are due only to forward failure. If there is no dyspnea, no hepatic enlargement, or no edema, and the patient complains only of fatigability or weakness or dizziness, salt restriction and diuretics, which result in decrease of blood volume, are apt to aggravate rather than to relieve the symptoms. There can be no doubt that the increase of blood volume in patients with cardiac decompensation serves a useful purpose, in that it enables weakened hearts to maintain a more nearly adequate output, and it is only when the increase of blood volume is excessive that it is necessary or admissible to attempt to reduce the amount of salt in the body. However, if symptoms or signs of passive congestion are present, salt restriction and diuretics are of definite value.

For the patient with minimal signs of congestion, only moderate restriction of salt intake combined with the use of ammonium chloride may be necessary. For other patients, the judicious use of mercurial diuretics is definitely indicated. I should say that if definite edema is present, or if mild signs of congestion persist after digitalization, salt restriction and the use of ammonium chloride, one of the mercurial diuretics should be employed. One is about as good as another, salyrgan-theophylline and mercuhydrin being somewhat less irritating when given intramuscularly than is mercupurin. These drugs should always be given intramuscularly, never intravenously; their diuretic effect is just as marked by intramuscular administration, and there have been more than a few instances of sudden death following immediately upon their intravenous use.

There is no need to give these drugs in large doses at very frequent intervals, and indeed there is danger attendant to rapid dehydration and salt depletion which may result from drastic diuresis. We have seen

several cases, and numerous others have been recorded in the literature in which severe symptoms or even death have resulted from the administration of large doses of mercurial diuretics at frequent intervals. Ordinarily, in cases of predecompensation, 1 cc. twice a week will suffice gradually to reduce the amount of water and salt in the body. It would be a good rule to weigh the patient when the course of mercurial diuretics is begun, and to continue their use until edema has disappeared and dyspnea is relieved, at the end of which time the patient should again be weighed. This may be labeled as normal weight, and the patient should thereafter weigh himself a couple of times a week, and an additional course of diuretic be given if his weight should increase more than 2-3 lbs. above this figure. Some patients will require no further injections for a period of months, whereas others may require injections once a week or once every two or three weeks.

It is to be noted that during the hot months, when patients may perspire a great deal and thus lose a considerable amount of salt, the danger of dehydration and salt depletion is increased.

I do not intend to deprecate the value of mercurial diuretics, for there is no doubt at all that their introduction represents the greatest advance in the treatment of heart failure since the introduction of digitalis by Withering one hundred and fifty years ago. Even after the development of frank congestive failure, restriction of activity, digitalization, and the judicious use of diuretics may enable patients to live comfortable and useful lives for several years; whereas before the introduction of mercurial diuretics, most patients who developed heart failure were dead within two years. Although in my opinion Dr. Harry Gold has advocated much too drastic use of mercurial diuretics, there is no doubt that his concept of maintenance doses of mercurial diuretics as well as maintenance doses of digitalis, has been extremely useful in the postponement and prevention of recurrences of congestive heart failure.

Time will not allow a discussion of the

use of quinidine for the therapy of cardiac arrhythmias in the absence of frank heart failure, nor will there be time to discuss the symptomatic management of these patients. I have found, however, that the general practitioner usually needs no instruction about the judicious use of sedatives, and about the importance of caloric restriction in patients who are too fat, and especially about the informal psychotherapy which these patients need and which the family doctor is in much better position to give because he actually knows his patients as people, and is much better able to treat them as patients rather than as cases.

If the principles and the few details which I have given are followed, and if the importance of regular though not necessarily very frequent observation is recognized, there is no doubt at all that the general practitioner is in a better position to handle most patients with heart disease than is the internist or cardiologist.

#### DISCUSSION

Question: (Dr. J. M. Bodenheimer): What about intravenous use of arsenicals in heart disease?

Answer: Arsenicals are not contraindicated for patients with syphilitic heart disease provided their use is preceded by more gentle antisymphilitic treatment with iodides and bismuth. At present, for the treatment of syphilitic aortitis we recommend iodides, bismuth, mapharsen and penicillin in succession.

Question: (Dr. J. M. Bodenheimer): What about vitamin E?

Answer: I think it is pretty well established that it is of no value in short-term treatment of heart disease.

Question: (Dr. J. M. Bodenheimer): What about absorption of mercurial diuretics in marked edema if given intramuscularly?

Answer: That is a good question. Our experience indicates that there is usually adequate absorption if the diuretic is given deeply in the muscle.

Question: (Dr. F. H. Davis): Are there any particular precautions to follow or helpful hints in the use of some of the newer digitalis-like drugs?

Answer: So far as we are able to find out there is no evidence of any one of the purified glycosides having a superior effect to the leaf. The indications for the purified preparations would be principally in those cases of the occasional patient who won't tolerate the leaf by mouth in therapeutic doses in which case digoxin or digitoxin should



be used; and secondly, in emergency when rapid digitalization may mean life or death.

Question: (Dr. F. H. Davis): How about pulling of teeth, minor operations, etc. in these cases.

Answer: In my experience I have found patients with heart failure or frank decompensation can stand minor surgery well. There is no contraindication to minor operations in patients with myocardial predecompensation. If they respond to therapy major surgery can be performed with reasonable safety.

Question: (Dr. F. H. Davis): Should one use sulfa drugs in case of pulling teeth in these patients?

Answer: I would say whenever teeth, which are carious, are removed from sockets at the seat of pyorrhea, penicillin should be employed more or less routinely to prevent bacteremia whether there is heart disease or not. Following extraction of carious teeth or severe pyorrhea 20 or 30 per cent have transient bacteremia after the teeth are removed. I would not like to have transient bacteremia even if I did not have heart trouble.

Question: (Dr. Koretzky): What about the use of penicillin in luetic heart disease in patients past sixty years? Does heart size diminish with penicillin?

Answer: If the patient is past sixty and has not developed failure, I don't think he needs any treatment but there would be no contraindications in the aged individual. Most patients with syphilis past fifty or sixty years of age don't need any treatment.

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## TREATMENT OF THE COMMON COLD\*

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NEW ORLEANS

### GENERAL CONSIDERATIONS

This discussion of the common cold, naturally, will not include such conditions as epidemic influenza or so-called virus pneumonia. It also does not seem practical or advisable to cover the many possible complications arising from secondary invasion of bacteria.

The medical and economic importance of colds cannot be overemphasized. "The common, acute, self limiting, chiefly air borne infections of the respiratory tract constitute the majority of conditions encountered in civilian practice. Thirty-two per cent of home visits and 15 per cent of office

visits of the general practitioner are due to these conditions. There are about 250 million respiratory infections in the United States each year. Loss of time from industry and school resulting from these is more than from all other conditions combined."<sup>1</sup> It was one of the chief causes for admission into the medical wards of service hospitals during the last war.<sup>2</sup>

In the majority of instances the initiating agent belongs to the group of filtrable viruses. Organisms, such as the pneumococcus or streptococcus, take advantage of the preceding pathological changes and give rise, secondarily, to the more serious infections, such as sinusitis, otitis, bronchitis, and bacterial pneumonia.

While it is now generally acknowledged that the common cold is a virus infection,<sup>3</sup> electron microscopic observations show a difference in this virus from that of epidemic influenza.

The greatest incidence is during the fall and spring when there are more rapid changes in temperature. The incidence is less during extremely cold weather, and it is possible that a major factor here is that the infected individual is less apt to get out and spread the disease. One of the earliest notes calling attention to the reduced frequency of respiratory diseases in cold weather was from the observations made during Scott's Antarctic Expedition in 1912.

Many predisposing factors have been mentioned. Among them are chilling, exposure to cold, especially following prolonged warmth; drafts, malnutrition, improper diet, especially deficiency in the vitamins A, B, and C; lowered body resistance from previous diseases; chronic foci of infection in the respiratory tract; continued trauma of the mucous membrane of the respiratory system, as from chemical, physical or allergic agents. Mixed crowds are always a potential source of danger.<sup>1</sup>

### PROPHYLAXIS

In prophylaxis the avoidance of exposure to the infection is the first consideration. Especially in periods when the disease is

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prevalent, the individual may benefit by not visiting the sick, and by staying away from gatherings. The isolation of patients is of major importance, particularly during the first day or two when infectivity is strongest.<sup>1</sup> Isolation of the patient not only prevents spreading the disease but lessens the chances of his acquiring a cross-infection.

To avoid spreading the disease one of the simplest, easiest, and yet the most neglected precaution, is the avoidance of coughing or sneezing when in the presence of others, or in quarters, the air of which may soon be breathed by others. When coughing or sneezing is necessary the face should be covered with a heavy handkerchief if the patient is out; in the bedroom a towel may be used. In an emergency he may pull the bed covering over his face.

Measures for building up resistance have been advocated through the generations, but their value is still problematic. This refers particularly to outdoor exercises, cold baths, and other so-called "hardening" processes. Such measures were somewhat discredited during the last two wars when such a large percentage of soldiers, living under thoroughly ideal conditions from this standpoint, were not protected.

In the hospital wards the use of germicidal lamps and air-conditioning has seemed to be of considerable benefit.<sup>4</sup>

At one time vitamins were enthusiastically advocated, especially vitamin A, and this product received the synonym of "the anti-infective vitamin". It is highly probable that a vitamin deficiency may render one more susceptible to the disease, but it is not thought today that any excess of vitamins above the normal requirements will lessen susceptibility.

The value of bacterial vaccines is still a moot question. As the common cold is a virus infection it would not seem logical that bacterial vaccines would convey any direct immunity. The period of immunity even from the disease is comparatively short and somewhat imperfect<sup>5</sup>. It is possible that the development of complications from secondary bacterial invasion may be reduced. "The use of vaccines is still con-

sidered to be in the experimental stage".<sup>6</sup> Extensive clinical experiments, carried out with adequate controls indicated that vaccines, orally or hypodermically, had no effect.<sup>8</sup> It should be remembered that the A and B influenza virus vaccine carries no protection against the common cold.<sup>7</sup>

Quinine in the treatment of colds was at one time one of the most popular remedies. One recent report, not only claimed good results in treatment, but excellent prophylactic benefit by the use of 8 to 10 grains daily during periods of epidemic. Against the use of this agent might be argued its well known effect on the auditory apparatus, which might add to the burden imposed by the disease itself on those structures.<sup>9</sup> The prophylactic use of penicillin has been reported as having value.<sup>10</sup>

#### GENERAL CARE

In therapy, proper rest in bed seems to be the only measure that is universally accepted as having a definite influence on the course of the disease.<sup>5</sup> This is not followed as rigidly as is the case in epidemic influenza. Many colds are so mild that any large measure of restriction would seem inadvisable. The degree of rest is best dictated by the amount of discomfort the patient is experiencing and the height of the temperature. In practically all uncomplicated cases the patient may have bathroom privileges. The major considerations are to prevent the patient spreading the disease and to lessen the chances of acquiring a secondary bacterial infection. In any event, exposure to drafts, chilling, and getting wet are best avoided. Except in the presence of a material elevation of temperature or other symptoms, such as sore throat, persistent cough or nausea, little, if any, dietary restrictions are indicated. There may be some advantage in the old custom of emphasizing cool fruit juices and hot milk drinks.

As the respiratory tract is irritated, smoking would seem to be inadvisable. We have a clue here to the protective processes of nature, as many of these patients are robbed of their desire for smoking during the course of the disease.



## DRUG THERAPY

It is well to acknowledge in the beginning that we have no specific therapy. On the whole, drugs exert little influence on the course of the infection or on the percentage of complications,<sup>1</sup> and treatment is almost purely symptomatic.<sup>2</sup> Through the ages various drugs and remedial measures have been advocated as having more or less specific value. Many of us can remember the time when it was thought that most colds could be aborted by diaphoresis. An old routine was the hot mustard foot bath, with the patient draped in a blanket that surrounded the foot tub. During this time a large dose of Dover's powder and a large hot drink (with or without a spike) were administered. The patient was then put to bed in a closed room and warmly covered. I sometimes imagine that my mouth still burns from the hot sassafras tea which was the beverage for this regime in my community when I was a boy.

The time honored initial purgative has justly fallen into disrepute. It is probably distinctly contraindicated. "The patient may be kept awake when he should be sleeping; exposed to cold when he should be warm and protected; disturbed when he should be at rest, and his vital resources depleted when they should be conserved."<sup>5</sup> Should there be any special indication, a mild laxative may be administered in the early morning.

Gargling has been largely discontinued. Nose drops and sprays probably do more harm than good. The oil preparations are considered distinctly dangerous. Most of the vasoconstrictor preparations are followed by vasodilation that leaves the patient worse for their use. When it is necessary to open the nose enough for the patient to go to sleep an isotonic glucose solution of ephedrine sometimes may be used to advantage. Of course, in the presence of complications, such as otitis media or sinusitis, sprays may be indicated. Argyrol is at least questionable. The benefit is limited or absent and the chances of argyria are too definite to justify the risk. Quinine is now seldom employed. It still has its ad-

vocates.<sup>9</sup> The value of atropine is still an undetermined problem. My own impression is that in small doses it has a field of usefulness where there is a tendency to rhinorrhea. Papaverine, especially with codeine,<sup>11</sup> has been advocated for many years. The present tendency is away from its use.<sup>3</sup> Codeine alone, or with other agents, is probably one of the safest and most efficient remedies for promoting comfort. Coal tar derivatives, particularly aspirin, are almost universally employed. The impression is that aspirin is the most satisfactory and that its value is limited to promoting comfort. Bismuth, especially the intramuscular injections of the salicylate in oil, has been advocated.<sup>12</sup> It is probable that its usefulness is limited to the prevention or relief of complications from certain types of organisms. Various alkalizing agents have been largely used and may have some value.

Among the various other agents recently recommended are: propadrin,<sup>13</sup> gamma globulin,<sup>14</sup> ascorbic acid<sup>15</sup> and benadryl.<sup>16</sup> It is probable that the antihistamine drugs have a tendency to lessen the discomfort, especially of rhinitis. In many patients they also act as sedatives.

Last, but not least, are penicillin and the sulfonamides. While good results have been reported from these agents,<sup>17, 18</sup> the impression is that "Sulfonamides and penicillin do not shorten the course of colds and they should be used only when signs of involvement of the sinuses, tonsils, or lungs are apparent."<sup>1</sup> It is held that since most acute respiratory diseases are due to viruses, which are not affected by these agents, the only possible justification for their blanket administration is as a prophylactic measure against complicating bacterial infections.<sup>19</sup>

For about twenty years I had charge of the medical treatment of the student nurses at the Southern Baptist Hospital in New Orleans. These young women were instructed to report promptly to the nursing school authorities upon any evidence of any illness. In the case of colds, if they showed fever they were put to bed and kept there

until the temperature had been normal for twenty-four consecutive hours. They were given sodium bicarbonate, 1 Gram, and sodium citrate, 2 Grams, about every three hours when awake. This was given in carbonated water. Acetylsalicylic acid, 0.3 Gram, when needed for discomfort. Codeine sulphate, 0.03 Gram, when necessary. The patients were instructed not to blow the nose with violence, in order to lessen the tendency to sinusitis or otitis media. They were instructed to cover the face properly when coughing or sneezing. If there was much rhinitis a spray of isotonic dextrose solution of ephedrine was used when necessary to secure normal breathing for sleep. A laxative or enema was used only if there was constipation. In the matter of rest, diet, etc., the cases were managed as outlined in the preceding paragraphs under general care.

In house practice one or both of the following prescriptions are often employed:

## R

Ammon. Brom.	1½ dr. or 6 grams
Sodii Bicarb.	3 dr. or 12 grams
Sodii Citrat.	1 oz. or 30 grams
Liq. Potas. Citrat. q. s. f. oz.	6 or 180 cc.
Sig: Two teaspoonfuls in carbonated water every two or three hours when awake.	

## R

Codeinae Sulf.	3 gr. or 0.2 gram
Atropinae Sulf.	1/40 gr. or 0.0015 gram
Camph. Monobrom.	10 gr. or 0.6 gram
Acid Acetylsal	50 gr. or 3.2 grams

M. ft. cap. No. 12

Sig.—One every 4 hours till relieved.

These simple plans are not offered as having any specific value, but our results have been fairly satisfactory.

## CONCLUSIONS

In the past there were few conditions for which there were more "cures". We know now that most of these were without value and that some were harmful. Some misconceptions are prevalent today even in the medical profession.

Prophylaxis has made little advance and some suggested measures carry an element of danger.

General care may contribute much to favorable progress and may reduce complications.

We have no specific therapy for the cold as such and effort is directed mainly to promoting comfort and preventing complications. Should secondary infection develop, early recognition and prompt resort to specific treatment may accomplish much—even to saving the patient's life.

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## DISCUSSION

Question: (Dr. J. M. Bodenheimer): Where does the infection stay between the epidemics?

Answer: I wish I knew. I have taught so long it does not embarrass me to say I don't know. We think this condition is more or less endemic; endemic almost everywhere. On Scott's expedition to



the Antarctic there were no acute respiratory infection's except one case of pneumonia, and that was in a man who was drunk and lay down in the snow and went to sleep.

Question: (Dr. J. M. Bodenheimer): What is the value of UBA?

Answer: This has not been established in the case of a common cold.

Question: (Dr. M. B. Casteix): What is the value of respiratory vaccines in prevention of complications?

Answer: In a review some time back, I found that no less an authority than Cecil thought they were of distinct value. In the extensive experiments carried out in the mines of South Africa vaccines were reported as useless. The late Dr. Charles Bloom said that vaccines had an efficiency of about 25 to 50 per cent. It is highly possible that these vaccines have a field of usefulness but it is not established at all.

Question: (Dr. O. L. Sanders): Do you recommend aureomycin?

Answer: I have had no experience in this for the common cold. Just in passing I will say that Dr. Paine, who did much of the original work on chloromycetin said it acted so well in so-called virus pneumonias that he refused to be quoted until it was more definitely established. However, for the simple, common cold I would hesitate to recommend any of these preparations because I believe that most of these infections will be over in a few days. If complications develop it is a different story.

—o—

## OCULOGLANDULAR TULAREMIA\*

J. WILLIAM ROSENTHAL, M. D.

NEW ORLEANS

One often thinks of oculoglandular tularemia as a specific entity. However, as tularemia is studied it becomes apparent that its manifestations are so protean that a total knowledge of the disease is necessary. The ophthalmologist, therefore, attending such a case must be able to diagnose tularemic pneumonia, fluctuating buboes or other manifestations, but should call in one more capable to handle the treatment of them.

### EPIDEMIOLOGY

Our knowledge of this disease has steadily grown since McCoy first isolated *Pasturella tularensis* from the livers and spleens of ground squirrels affected during an epizootic in Tulare County, California.

(Incidentally, the disease is now uncommon in that region.) The epidemics in man depend upon the epizootics of the vectors. The latter are many: squirrels, rabbits, deer, flies, mosquitoes, ticks, lice, hogs, sheep, house pets, beavers, horse flies, quails, grouse, sage hens, rats, mice, and even fish. Each vector plays a more important role in a different area, and thus the time of human epidemics varies from place to place. In Wisconsin where rabbits cause most infections, and the hunting season is in November, most infections occur during that month. In Arkansas, on the other hand, ticks play the leading role of vector, and most cases are found during the summer months. Occupation plays a role in those being affected. We expect cooks, butchers, hunters, farmers, and laboratory workers, then, to have the disease more than others. Chance infections may occur all year round, and do, as can be seen by the reports in our own locality. (Table 1) Infection can be obtained with or without an abrasion on the hand and in either case may or may not form an ulcer. Squeezing infected ticks can cause the ulceroglandular or oculoglandular type if the eye is rubbed. The typhoid type usually starts from the ingestion of insufficiently cooked, infected meat. The anginal type (ulcer on the tonsil) has been reported due to drinking water frequented by infected insects and to aspiration of infected material by a laboratory worker. Since the incubation period is one to ten days (usually two to five), and because of the speed of modern travel, we may expect to find the disease in any part of the United States or in the world, for that matter, as it is worldwide in its endemic extent.

We should all, therefore, be cognizant of the disease, because its prompt diagnosis and treatment will save the patient many days of morbidity. The mortality used to be from 6 to 10 per cent. With our excellent chemotherapeutic agents now, however, it is 1 per cent or less. Eight hundred and sixty-nine cases have been reported in the United States during the first thirty-six weeks of 1949, with a median of

\*Presented at meeting of the Orleans Parish Medical Society, February 13, 1950.

TABLE 1  
TULAREMIA CASES\*  
LOUISIANA  
1948

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
TOTAL	3	7	6	6	5	2	..	..	2	3	2	9
Ascension	..	..	..	1	..	..	..	..	..	..	..	..
Bienville	..	..	..	1	..	..	..	..	..	..	..	..
Bossier	..	..	..	..	1	..	..	..	..	..	..	..
Caddo	..	..	1	1	3	..	..	..	..	2	..	1
DeSoto	..	..	..	..	1	..	..	..	..	..	..	..
E. Baton Rouge	..	..	1	..	..	1	..	..	1	..	1	..
Franklin	..	..	..	..	..	..	..	..	..	..	..	2
Jackson	..	..	1	..	..	..	..	..	..	..	..	..
Lafayette	2	..	..	..	..	..	..	..	..	..	..	..
Lafourche	..	..	1	..	..	..	..	..	..	..	..	..
Madison	..	..	..	..	..	..	..	..	1	..	..	..
Orleans	..	5	..	..	..	..	..	..	..	..	..	3
Ouachita	..	..	..	..	..	..	..	..	..	1	..	..
Rapides	..	..	..	..	..	1	..	..	..	..	..	..
Richland	..	..	..	..	..	..	..	..	..	..	..	2
Sabine	..	..	..	2	..	..	..	..	..	..	..	..
St. Mary	..	..	..	1	..	..	..	..	..	..	..	..
St. Tammany	..	..	..	..	..	..	..	..	1	..	..	..
Terrebonne	..	..	2	..	..	..	..	..	..	..	..	..
Union	..	..	..	..	..	..	..	..	..	..	1	..
Webster	1	2	..	..	..	..	..	..	..	..	..	..

\*Louisiana State Department of Health, Tabulation and Analysis Section Dec. 27, 1949

666 cases for the years 1944-1948. This may be compared with a median of 2,886 cases for typhoid and paratyphoid fevers for the same period.

#### TYPICAL COMPOSITE CASE HISTORY (UNTREATED)

The patient usually presents himself on the second or third day of the disease, with the history of having cleaned a rabbit or found ticks on his body. Two or three days later he develops malaise, with the primary site being sore. The next day he may have a low fever, nausea, sweats, or a chill, and the regional nodes are enlarged and tender. Then the fever rises to 103° to 105° F. with chills and sweats. Regional adenopathy is quite evident and the primary site shows a papule which then ulcerates. If the lesion is on the hand, the epitrochlear and axillary nodes enlarge; if on the leg, the inguinal nodes; if a conjunctival lesion, the preauricular and cervical nodes. In the

typhoidal type, vomiting, diarrhea, and abdominal pain develop, plus other general symptoms, no primary lesion being seen. No primary ulcer may occur if the disease is of the glandular type, only adenopathy being found. In the anginal type, the primary ulcer is on the tonsil and the cervical nodes are involved. Multiple primary lesions may be found, both on the exposed and covered parts of the body. Even bilateral conjunctival lesions have been seen. Occasionally, the patient presents himself in the second or third week of the illness, having been treated at home, or ineffectually by another physician. The findings then will be consistent with the stage of the disease.

A bacteremia occurs during the first (or second) week, accounting for such findings as enlargement of the spleen and liver, pneumonia, and meningismus. Therefore, we see that with any primary form of the disease, complications in distant parts of the body may occur.

During the first week, the patient is very ill, with temperatures spiking from a base of 99° to 101° F., up to 103° to 106° F. Headache, backache, nausea, dizziness, and marked prostration are present. The primary ulcer site gets secondarily infected by this time, causing a necrotic punched-out ulcer with sharp edges and a dirty base. Red streaks of angitis can be seen, causing the buboes to enlarge and to become fluctuant. The total white blood count will average about 12,000 with some increase in polymorphonuclear leucocytes. Skin manifestations are many and varied. They may be: erythematous, vesicular, macular, urticarial, papular, acneform, pustular or maculopapular.

Chest x-ray may reveal an atypical type of bronchopneumonia, often with a small pleural effusion from which organisms may be cultured. The sputum in such cases also contains the organisms. Pericarditis has been found, as well as generalized peritonitis. One group of patients is unable, antigenically, to cope with the disease, and in these, death can occur during the first week. In the typhoidal type, prostration,



abdominal pains, vomiting, and diarrhea can be found.

The second week of the disease usually finds the fever beginning to spike less, but it remains at a high level, gradually descending day after day, so that at the end of the week it is about 101° F. The primary lesion shows signs of healing, with sloughing of the necrotic tissue, and formation of granulation tissue at the end of the week. Lymph glands are usually quite fluctuant. The pneumonic involvement usually spreads, and is evidenced by pleuritic pain, cough, dyspnea, and production of sputum. Meningismus may be manifest. The conjunctival ulcer, which usually is on the upper or lower tarsal conjunctiva, seldom involving the eyeball, follows the course of any other primary ulcer. Occasionally, however, corneal ulcers develop which may go on to perforation. Acute purulent dacryocystitis is a not infrequent complication.

Without treatment, the disease usually lasts two or three months, the fever gradually subsiding, the ulcer healing, the lymph glands rupturing spontaneously, or remaining fluctuant a long time. Pneumonic lesions slowly disappear. Conjunctival lesions heal well, leaving only a slight scar or possible granulation tissue which may have to be touched with silver nitrate. The period of convalescence is long, without proper therapy, lasting months. Mild exacerbations of symptoms often occur, with much fatigue during the remission periods.

#### METHODS OF DIAGNOSIS

##### 1. *Clinical observation.*

2. *Skin test.* An intradermal skin test with killed *B. tularensis* organisms is a good diagnostic procedure during the first week because it is positive in 92 per cent of the cases when agglutinations are still negative. It takes forty-eight hours to get positive. However, it has the disadvantages of all intradermal tests.

3. *Culture.* Organisms apparently may be cultured only on blood-glucose-cystine agar, egg yolk, or other specialized media, which may account for many previous re-

ports of negative cultures. The organisms may be obtained from the sputum, blood, pleural fluid, or the primary lesion, rarely by bubo aspiration. From the culture organisms may be smeared and stained or inoculated into laboratory animals.

4. *Animal inoculation.* Organisms from cultures may be injected into mice or guinea pigs as mentioned above, or any of the sources for culture may be mixed with saline and injected into the animal's peritoneal cavity. The animal usually dies in four to seven days, and on autopsy shows focal necrosis of the liver and spleen which may be cultured as above, or smeared and stained. Because of the danger of laboratory workers contracting the disease even through the unbroken skin, many laboratories refuse to use culture or animal inoculation methods.

5. *Agglutinations.* Aside from the clinical signs, this is probably the most satisfactory method of diagnosis. The test is very reliable. However, it becomes positive only after about two weeks, depending on the case. The first few days of the disease find the titer to be zero. It may be 1:20 on the ninth day of the disease, about 1:80 on the thirteenth, 1:160 on the fifteenth, 1:320 on the seventeenth, and so on, up to about 1:5120 which is about the usual peak, reached in the third week. Levels up to 1:163,840 have been seen. The onset of positive agglutinations also varies widely and was positive only on the forty-third day in one case. After that, the titer gradually falls, but the test remains positive, agglutinins being found throughout life.

The agglutinin level for diagnostic purposes varies with different authors. However, the levels 1:80 and 1:160 are within the "diagnostic range". Levels above these are definitely positive. We must remember, however, several things:

A. Serial agglutinations should be taken, and a rising level is more significant than one which is stationary.

B. Patients who are not treated adequately and may go on to death, may show a zero level, a stationary level, or a decreasing level after an initial high. Some pa-

tients never do develop antibodies, and it is this group that may succumb to the infection in a few days if adequate therapy (streptomycin) is not given from the onset. Therapy here is a lifesaving procedure.

C. In another group of patients streptomycin therapy may be so bacteriocidally efficient that a Herxheimer-like reaction is produced after one or two days' treatment. Excess antigen is present in the circulating blood. This reaction manifests itself as an increase in general symptoms, including malaise, rise in temperature, decrease in agglutination titer, and generally feeling ill again. Local signs (bubo, pneumonia, and ulcer) do not get worse. With continuation of therapy, the patient undergoes rapid recovery.

D. In any severe febrile disease, the existing titer of antigens will rise for any other disease which has antigens in the patient's serum. Thus, a rising titer for typhoid O and H and paratyphoid A and B may occur, initially, with the titer for tularemia. However, the levels for these diseases will not reach diagnostic levels unless the patient has recently recovered from one of the diseases. Also, it will be seen that the level for tularemia, after a few days, will begin to get progressively higher, while the others will stay at a low level.

E. Some human tularemia sera and some artificially prepared antitularenses sera agglutinate *Brucella abortus* and *Brucella melitensis*. After an extensive serological search, Francis and Evans<sup>16</sup> concluded that:

"I. Because of the frequent cross agglutination between tularensis on the one hand, and for abortus or melitensis on the other, serums from suspected cases of tularemia and undulant fever should be tested for agglutinations of tularensis and either abortus or melitensis, unless the clinical history points definitely to a recognized source of infection for tularemia or undulant fever.

"II. A serum which shows a marked difference in titer for tularensis on the one hand, and for abortus or melitensis on the other, can usually be classed by the higher titer as due either to tularemia or to one of the varieties of *Brucella melitensis*.

"III. A serum which agglutinates all three organisms to the same or nearly the same titer should be subjected to agglutinin absorption tests."

#### PATHOLOGY

The pathologist sees two types of lesions—acute and chronic. The acute lesions are seen mostly in the lymph nodes and primary lesion, the spleen, liver and lung showing the changes to a lesser extent. Focal necrosis and suppuration are the characteristic acute findings.

In the chronic forms, the lesions may pathologically be confused with tuberculosis. Central necrosis, with epithelioid and giant cells, is found.

#### BACTERIOLOGY

*Bacterium tularensis* (called by some, *Pasturella tularensis*) is a small, nonmotile, pleomorphic, Gram negative, aerobic, non-spore forming bacterium. In young cultures, bacillary and ovoid forms predominate, but in old cultures it takes a coccoid form.

The colonies are round, opaque, smooth, and buttery in consistency. It grows only on media containing appreciable amounts of cystine, as egg yolk and blood-glucose-cystine agar.

The organism is killed by:

1. Heat at 56° to 58° C. for ten minutes.
2. Thorough cooking of infected tissue.
3. Formalin (0.1 per cent or 37 per cent formaldehyde) for twenty-four hours if the organism is suspended in saline.

Rabbit tissues kept frozen at -14° C. retain the virulence of the organism for six to eighteen months.

#### DIFFERENTIAL DIAGNOSIS OF OCULOGLANDULAR TULAREMIA

There are only three diseases which may cause a severe necrotizing conjunctivitis with a preauricular node, plus an acute generalized debility with high fever. These are tularemia, diphtheritic conjunctivitis, and streptococcal conjunctivitis. In all of these, the lids and face are edematous; preauricular, submaxillary, and possibly cervical adenopathy are seen; and the palpebral conjunctiva is red and edematous. A true membrane exists.

Tularemia may be proven early in the disease by: culture of the ulcer or aspirated bubo on blood-glucose-cystine agar, skin test, or animal inoculations. The ulcer edges are sharp and the base is dirty and



necrotic. The true membrane which forms bleeds upon removal. Pus which forms in the conjunctival sac and at the inner canthus is of the usual greenish color due to secondary invaders. Corneal complications are uncommon. Diagnostic methods have already been discussed. Multiple primary sites and a compatible history also help in the diagnosis.

Diphtheritic conjunctivitis of the oculoglandular type, also forms a true membrane and the patient may be acutely ill. There may be a history of diphtheria contact. Here, the membrane is grey, not yellow as in tularemia, and though also removed with difficulty, a hard greyish tissue, in which the vessels are obliterated, is found beneath. The lids in diphtheritic conjunctivitis are stiff and brawny in severe cases, a finding not seen in tularemia. Conjunctival discharge in diphtheria is usually of a glaring yellow color. Corneal complications are frequent. Therapeutic trial of diphtheria antitoxin dropped into the conjunctival sac and given intramuscularly in adequate dosage may be used if still in doubt.

Severe streptococcal conjunctivitis is the third acute condition to be considered. The membrane here spreads very rapidly, and the conjunctival discharge is thin and scanty. The smear and culture should be an early diagnostic help. Corneal involvement occurs early, with necrosis, perforation, and its complications. With such a virulent infection possible, it is wise, therefore, to give local and general penicillin or sulfa therapy, if only as a therapeutic trial, early in the disease.

Since edema of the lids in any of these conditions defies lid eversion, one may consider an orbital cellulitis or abscess in the differential diagnosis, until the conjunctival lesion is seen. Findings in this condition not found in the three above are: proptosis, excess chemosis, tenderness and pain on pressure or rotation of the eyeball, and limitation of ocular motion. X-ray evidence of excess orbital density or sinus infection break-through also may be found.

Other causes of membranous and pseudomembranous conjunctivitis may be considered early, before the general symptoms reach their height. At the onset of fever and prostration, however, the following diseases would be less likely to be present even though they produce an oculoglandular complex: tuberculous conjunctivitis, conjunctivitis due to *B. pseudotuberculosis rodentium*, epidemic keratoconjunctivitis, syphilitic conjunctivitis, and chancre of the lid, Parinaud's conjunctivitis, inclusion blenorrhea, agricultural conjunctivitis, sporotrichosis of the conjunctiva, and conjunctivitis due to the *Micrococcus polymorphicus necroticans* of Pascheff.

According to Duke-Elder,<sup>11</sup> "Each case presenting the clinical picture of a unilateral conjunctivitis with lymphadenopathy should, therefore, be subjected to the following tests:

1. Smears and cultures, which may show sporotrix and leptotrix.
2. Guinea pig inoculation with conjunctival scrapings, which may show tularemia, tuberculosis, or the organism of necrotic infectious conjunctivitis.
3. Partial excision for histological examination which may show leptotrix or tubercles.
4. Blood examination for a Wasserman reaction or an agglutination test for tularemia."

#### THERAPY

I. Streptomycin. This chemotherapeutic agent is now the proven, tried, and true cure for most cases of tularemia. Within twenty-four to forty-eight hours of administration, the temperature drops precipitously (Figure 1) to near normal levels, all lesions start to heal, and the patient feels about normal, although weak. Two or three grams of streptomycin per patient is on the average the total dose needed, according to Foshay.<sup>15</sup> It should be given intramuscularly in divided doses every three or four hours. I believe 1 gm. of streptomycin, intramuscularly, per day for four to five days, then 1/2 gm. streptomycin for three to four more days is sufficient for any case of tularemia with or without com-

## GRAPHIC CHART

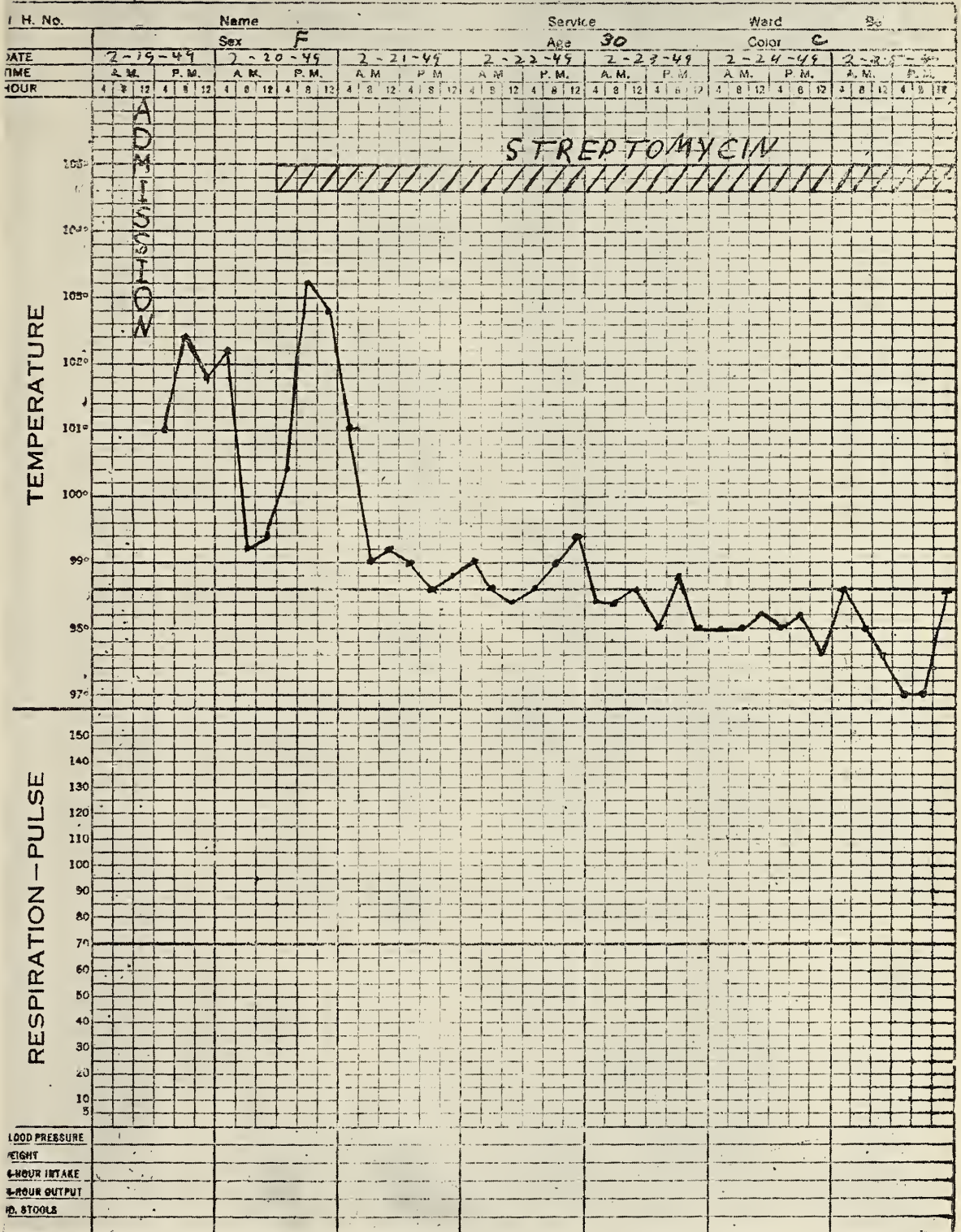
CHARITY HOSPITAL OF NEW ORLEANS  
AT NEW ORLEANS

Figure 1.



plications. Subcutaneous and intravenous continuous drip may be used to give the streptomycin, but apparently has no therapeutic advantages over the intermittent intramuscular method. (One gram of streptomycin equals one milion units.) Foshay<sup>15</sup> reports that in the blood, streptomycin is bacteriostatic at 0.3 micrograms per cubic centimeter; it is bacteriocidal at 1.0 micrograms per c.c. for one-half hour, and bacteriocidal at 2.0 micrograms per c.c. for eight minutes.

It should be evident from this, that too much streptomycin is usually given to tularemia patients. Some reports in the literature show cures with as little as 1.5 gm. total dose. Prolonging therapy will not heal primary ulcers faster, will not cause buboes to disappear without incision and drainage, will not hasten resolving of pulmonic lesions, and will not make conjunctival ulcers heal faster. However, if the streptomycin is given before a primary lesion (ulcer) forms—that is, when it is in the papule stage,—it will cause regression of the lesion and will prevent its ulceration. This is important, because secondary infection of the primary lesion is prevented which in turn prevents secondary infection of the buboes, which therefore heal faster, and without the necessity for their incision and drainage.

Streptomycin therapy will not prevent development of diagnostic agglutination titers or their proper time of development.

No severe cases of streptomycin toxicity have been reported during tularemia ther-

apy even though 40 grams and over have been given to some patients. Only occasional skin rashes have been seen. Apparently, however, specific and/or regular tests for toxicity have not been made.

Streptomycin is not the total therapy :

1. It may be started too late in the disease, but even though started late, it shortens convalescence materially. However, many of the complications have already occurred, and only time plus natural healing processes can overcome them. Streptomycin, therefore can be expected to be less effective when used late in the disease (third week or more). (Figure 2.)

2. Lack of supportive treatment decreases the patient's feeling of well-being. Sedation is necessary at times; analgesics and antipyretics are certainly in order. Local cleansing therapy to primary ulcers decreases the secondary infection. Certainly the face swelling in the oculoglandular type should be reduced with cold compresses. Here also, the conjunctival sac should be kept clean of exudates by irrigations; ointments should be used to keep the lids from sticking together, and the cornea should be protected by 5 per cent sulfathiazole or penicillin ointments. Patients with pulmonary lesions should have indicated supportive treatment, including pleural cavity aspiration, if necessary.

3. Only a few cases of apparent resistance of the organism to streptomycin have been reported. Most of these have been overcome by increasing the dose of streptomycin. One case was cured by using

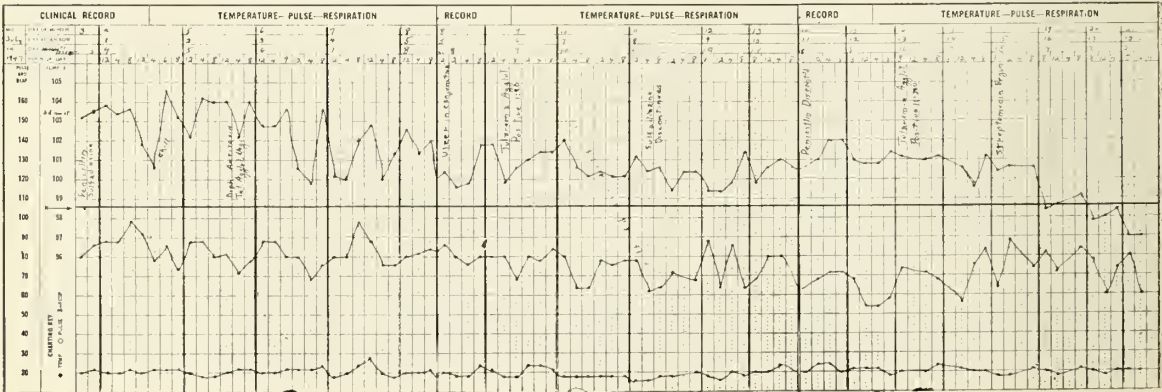


Figure 2.

aureomycin along with streptomycin. These cases have been scattered and inconstant.

Streptomycin, therefore, should be given on the suspicion (clinical or laboratory) of tularemia because (1) it decreases the degree and length of morbidity to less than half of that previously recorded without the drug; (2) it decreases the mortality rate; and (3) it saves the lives of those few patients who do not respond to the infection with adequate white blood cell and antigenic levels.

II. Supportive therapy has already been mentioned.

III. Incision and drainage of buboes is important when they are fluctuant, as they resorb very slowly without it. If they are allowed to rupture spontaneously, which is uncommon, more scarring than necessary is produced, and convalescence is prolonged. Repeated aspiration with injection of streptomycin or penicillin is ineffective.

IV. Aureomycin has been used in mice tularemia, and has been shown to be even more effective than streptomycin. In the few patients where it has been used in man, it has thoroughly lived up to its experimental expectations. It may some day become the drug of choice in tularemia.

V. Chloromycetin as used in mice tularemia was shown to be less effective than streptomycin, but may later prove to be worthwhile if resistant strains of the organism develop.

VI. Polymixin, even experimentally, has not been effective in tularemic infections.

VII. Penicillin and the sulfa group of drugs, although not effective against *Pasturella tularensis*, have their place in the therapy of this disease by combating secondary invaders of the primary ulcers, the buboes, the lung, and the conjunctival sac.

VIII. Foshay's immune and hyperimmune sera, although exceedingly helpful therapy before the advent of streptomycin, have been made obsolete by the latter drug.

IX. The use of convalescent serum is also obsolete.

X. Ecke<sup>12</sup> reports excellent results using 1.5 gr. of atabrine, three times a day for

five days, in several unproven cases of tularemia.

#### SUMMARY AND CONCLUSIONS

1. Because of the diffuse manifestations of tularemia, one must know how to treat any form of the disease, even though as an ophthalmologist one is confronted with an oculoglandular syndrome. An ophthalmologist should, therefore, not treat the oculoglandular type without adequate medical consultation, and conversely, the ophthalmologist should be consulted regarding the eye condition in those cases seen by others.

2. Suppurating lymph nodes and slowly resolving pneumonia account for most of the morbidity time after adequate streptomycin therapy. When fluctuant, the nodes should be incised and drained, only. Resolving pneumonitis should be followed with serial x-rays. Neither of these should prolong hospitalization.

3. Now that streptomycin is available, one should start treatment on the suspicion of the disease rather than wait for laboratory confirmation.

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## THE VALUE OF A HEARING CLINIC

### PRESENT POLICIES AND LONG-TERM OBJECTIVES OF THE HEARING CLINIC AT THE EYE, EAR, NOSE AND THROAT HOSPITAL IN NEW ORLEANS

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NEW ORLEANS

The magnitude of the problem of deafness in the United States is not known. Estimates range from 6,000,000 to 15,000,000 for all types of hearing difficulties. The most exact figures now available are derived from the National Health Survey in 1935-1936,<sup>1</sup> which covered approximately 2,500,000 persons, 48 per cent of whom were males. According to this survey, 1 of every 78 males surveyed, and 1 of every 85 females, had some type of hearing impairment. Between the ages of 35 and 44, 1 of every 103 males and 1 of every 108 females

had some hearing loss, the incidence rising with each succeeding decade until between the ages of 65 and 74 years, the distribution was 1 of every 14 males and 1 of every 18 females. Lederer and Hardy<sup>2</sup> estimated in 1946 that there were 20,000 deafened persons in each million of the population and that from 2 to 5 per cent of the school population was hard of hearing.

The implications of these figures are perhaps even more significant than are the statistics themselves. The estimate of deafness in the school population means that from 2 to 5 per cent of all children face life with a handicap which may later make them charges on the state. The estimate that there are 20,000 hard of hearing persons in every million of the population means that no city of any considerable size can escape this special problem. Although the proportion of deafened persons in advanced years reported in 1935-1936 may have remained constant, the actual number of such persons must be considerably larger now than it was then because of the increase in longevity which has occurred over the past ten to fifteen years. Moreover, the concentration of hard of hearing adults in the lower income and unemployed groups which was shown by the National Health Survey<sup>1</sup> clearly indicates that deafness is an occupational and public liability as well as a personal and social handicap.

Otologists in the past have not accepted their full responsibilities in respect to deafness. From the standpoint of active therapy auditory disability has been a discouraging field. As a result, most of us have been inclined to examine the patient, test his hearing, advise him to get a hearing aid, and pay little if any attention to what happened to him after that.

There is no longer any excuse for that line of conduct. The strictly therapeutic aspect of deafness is still not very encouraging, though it has its brighter sides. Certain types of deafness can be cured and others can be improved by therapeutic measures. Certain types can be prevented by appropriate prophylactic measures, the problem here being one of case-finding.

Finally, types of deafness which are incurable can be managed by a program of rehabilitation. These are incontrovertible facts. It is incumbent upon all otologists to accept them and to act in accordance with them, the best way of translating them into practice being by way of hearing clinics.

Clinics for the deafened and hard of hearing are not new. The Hearing and Speech Center at Johns Hopkins Hospital opened only two years ago, but Crowe's work at that institution, of which it is the culmination, began more than thirty-five years ago. The Otological Research Laboratory at the Abington Memorial Hospital in Philadelphia, founded by the late Dr. Walter Hughson, has been for many years a brilliant illustration of what can be accomplished in this field under the proper set-up. It remained, however, for hearing clinics to receive their real impetus during World War II, when brilliant results were accomplished at the Aural Rehabilitation Centers set up at Hoff, Borden, and Deshon General Hospitals under the supervision of Major Leslie E. Morrisett, who served as Consultant in this field in the Office of the Surgeon General. Each of these centers demonstrated what coordinated management can accomplish both in combat-incurred deafness and in the civilian varieties; it must not be forgotten that many of the men who were treated had their disability before they were inducted into service. Since the war numerous hearing clinics have been set up in various parts of the country and for almost the first time there is now becoming available to civilians the same type of expert care which service men received during the war and which is now provided for veterans.

There are in Louisiana about 25,000 deaf persons who are conscious of their defective hearing. Unquestionably, the number would be much larger if there could be included in it the many persons who have hearing defects of which they are not conscious. Up to last year there were in Louisiana only two institutions devoted to the care of deafened and dumb persons—the

institution at Chinchuba, operated by the Roman Catholic Church, and the institution at Scotland, operated by the state. Both are crowded beyond their capacity and both have long waiting lists.

#### GENERAL POLICIES OF THE HEARING CLINIC AT THE EYE, EAR, NOSE AND THROAT HOSPITAL

This is the story of the first ten months of operation of the Hearing Clinic, which was established at the Eye, Ear, Nose and Throat Hospital in New Orleans, June 1, 1948.

The clinic is not a private enterprise. It is a function of the Eye, Ear, Nose and Throat Hospital. All supplies are provided by the hospital. Space and equipment are provided by the hospital. Clerical and technical services are provided by the hospital. The services of the staff are given without charge, and the cooperation of every local otologist, whether or not he is a member of the hospital staff, is invited and would be welcomed.

All patients who pass through the Hearing Clinic undergo the same routine of investigation and management, regardless of their financial status. Patients who are unable to pay anything pay nothing. Patients who can pay something pay whatever they can afford. Private patients who are financially able pay a maximum of twenty-five dollars for the investigation. All funds received go into the Hearing Clinic and help to finance it, though the fees received do not, of course, come near to meeting the expenses.

*Case-Finding.*—The Hearing clinic secures patients in several ways:

1. Case-finding is a constant function of the free clinic operated by the hospital. Here the hearing of all persons is tested as part of the clinic routine and those who show any defects are diverted to the Hearing Clinic.

2. Some patients are referred by private physicians, who may lack the time and facilities for diagnostic testing. It is the policy of the Hearing Clinic to treat no patients referred to it by private physicians unless it is clearly instructed to do so. All other patients are returned to the referring



physicians after the work-up.

3. The Hearing Clinic works in close cooperation with the Orleans Parish Public School System, which for many years has had special teachers for the deaf and special classes for deafened children. Continuous case-finding is carried on in the schools, under the direction of a special investigator. Children, who because of inattention or for other reasons are suspected of hearing difficulties, are referred to her, and if the suspicion of deafness is confirmed, they are brought to the Hearing Clinic for full investigation and treatment. Before this facility was established they were merely trained in lip-reading and speech.

4. The Hearing Clinic also cooperates with the Louisiana Employment Service, again with mutual advantage. Persons who have lost their positions because of deafness, or who are unable to find employment for this reason, are investigated in the clinic, and are submitted to the necessary therapy or training. The Employment Service, on the recommendation of the clinic, will furnish hearing aids to persons who from the employability standpoint might be benefited by them.

5. Finally, the Hearing Clinic works in close cooperation with the local branch of the American Hearing Society, again with great mutual benefit. With the establishment of the Hearing Clinic its own work is enhanced. The trained worker assigned to the Clinic by the Society, has taken over many responsibilities which must be met if the full possibilities of such a clinic are to be fulfilled but which are not precisely the work of otologists, who, for that matter, are seldom trained to meet them.

#### ROUTINE OF INVESTIGATION

The routine of investigation in the Hearing Clinic is about as follows:

1. A complete history is taken and a complete examination made, exactly as they would be carried out in any other general investigation. This and other phases of the work-up are conducted by the internes and residents (six of each) attached to the hospital staff.

2. A complete auditory history is taken. Special attention is paid to the family history of hearing and to the possible influence of physiologic function, environment, and other factors on the hearing disability.

3. A complete examination is made of the nose, throat, and ears.

4. Complete hearing tests are carried out, including the whispered and conversational voice tests and the Rinne, Schwabach and Weber tests.

At this point I wish to emphasize the usefulness and the simplicity of tuning fork tests. The equipment is inexpensive and testing can be carried out by any physician. Most general practitioners, in fact, have the tuning forks in their offices and simply fail to use them. If they were universally used, case-finding in deafness would promptly advance by leaps and bounds. Physicians who could not themselves handle the deafened patients thus identified could refer them to otologists who could, or to a hearing clinic, for investigation, evaluation, and treatment or rehabilitation. In my own opinion, one of the most important things any hearing clinic can do is to disseminate information concerning this simple method of case-finding.

5. Audiometric testing. In general, the results of audiometric and tuning fork tests should agree. If they do not, the tests should be repeated until the discrepancy is clarified.

6. Thereafter the investigation is conducted according to the necessities of the special case. In other words, the program is rigid up to this point but is flexible thereafter. Roentgenologic examinations of the head are made in almost all cases. If the general examination of the mouth and teeth has shown the need for special dental consultation, the dentist is called into the case. The staff allergist sees all patients in whom allergy is suspected as a possible background for the hearing defect. Psychologic and psychiatric examinations are conducted as necessary. The evaluation of emotional, attitudinal, and other factors which might militate against rehabilitation is important, but we are extremely careful

not to create psychiatric and psychologic problems where they do not already exist.

7. When all the elements of the investigation have been completed, each case is evaluated by the entire staff. Our practice is to hold a weekly conference, lasting from an hour to an hour and a half, which is attended by all members of the staff and all consultants who can arrange to be present, and at which we are delighted to have the attendance of other interested physicians. From two to six cases are presented each week. The resident who has worked up the case makes the presentation and answers questions by those who have not already seen the patient, or he is examined by them, as fresh points of view are developed. Finally, the management appropriate to his case is outlined.

It is at these conferences that the full value of the coordinated investigation and treatment which are possible in a hearing clinic are most evident. The preliminary work-up is always thorough, or so it seems, until a question or suggestion from some member of the staff who is not familiar with the case opens new avenues of investigation and evaluation. The advantages of a joint approach to therapy and rehabilitation are too obvious to need discussion. Attendance at these conferences is an interesting and stimulating experience and the conferences themselves assure for the patient a well rounded approach to his special needs.

#### THERAPY

The management of the deafened person consists, according to the necessities of the special case, of medical or surgical therapy, dental treatment, radiotherapy, or narco-synthesis; instruction in lip reading; training in residual hearing; voice training and speech correction; the provision of a hearing aid and training in its proper use; vocational guidance; and any other special measures the individual patient may need to restore him to a useful, profitable existence. The mere listing of these various measures of therapy and rehabilitation makes clear the value of the liaison which has been established with the Public School

system, the State Employment Service, and the American Hearing Society.

One or two special forms of therapy might be briefly commented on.

*Surgical Measures.*—Surgery has a very limited field in the treatment of deafness. We make it a practice to clear up conditions which would need correction even in the absence of deafness, such as infected tonsils, and mastoid and sinus infections, but we resort to surgery only when it is clear that nonsurgical measures are not effective, and in our opinion there is usually little or no relationship between the deafness and the pathologic process. Sometimes an exceedingly simple procedure, such as the removal of an accumulation of cerumen, brings about a surprising degree of improvement in the patient's hearing.

The single surgical measure designed to relieve deafness *per se* is the fenestration operation, which is now generally performed by the nov-ovalis technic of Lempert or by the Shambaugh modification of the Lempert technic. This operation unquestionably represents the most important advance ever made in the active therapy of deafness. Its application, however, is extremely limited. It is useful only in deafness due to clinical otosclerosis, and is definitely contraindicated when nerve damage of any considerable degree is associated. It is sometimes useful in certain borderline cases of cochlear nerve degeneration, though there is at present no accurate, reliable test for estimation of the reserve cochlear nerve function. When the operation is indicated, when it is limited to cases in which it is suitable, and when the surgeon has been fully trained in the technic, it is sometimes brilliantly successful.

The number of cases in which the fenestration operation is indicated is, as has been intimated, very small. The field of all surgical procedures is, for that matter, very limited. Of the 105 patients who have passed through the Hearing Clinic at the Eye, Ear, Nose and Throat Hospital during the ten months of its operation, only



21, (20 per cent), were regarded as suitable candidates for any sort of surgery.\*

*Dental Measures.*—It may come as a surprise to many physicians to hear that the dentist attached to the staff of the Hearing Clinic is one of its busiest and most useful members. It is unfortunate that there is no general understanding of the possible relationship between dental defects and hearing disabilities. Costen<sup>3</sup> of St. Louis, and Goodfriend<sup>1</sup> of Philadelphia were the first to point out this relationship and to emphasize the etiologic importance of malocclusion which, according to Goodfriend, is a possible factor in 40 per cent of all cases of deafness. Furthermore, while it may be merely coincidental, it is nonetheless striking to find how closely the incidence of deafness parallels the incidence of edentulousness in the various age groups.<sup>5</sup>

When there has been a loss of teeth, particularly the molars, and there has been no replacement, or replacement has been inadequate, certain anatomic relationships become altered. The intermaxillary distance is decreased, or as dentists prefer to express it, there is a loss of vertical height. The condyles assume abnormal positions when the mandible is closed, being pushed posteriorly, superiorly, or medially. Sometimes there is actual erosion of the bony portion of the eustachian tube, with subsequent blockage by the mandibular condyle. Sometimes there is compression of the membranous portion of the eustachian tube by the shortened external pterygoid muscle. Sometimes tubular ventilation is decreased because of shortening of the *tensor veli palatini* muscle. Sometimes there is reflex contraction of the *tensor tympani* muscle, as the result of long-continued irritation by the condyle, with resulting loss of function of the tympanic membrane in the conduction apparatus.

\*Although we would never perform a fenestration operation on the mere indication of tinnitus, we have observed in a number of cases that this extremely annoying symptom has been greatly improved, or entirely eliminated, following this operation. We have also treated tinnitus by other methods, such as vitamin B therapy, with very good results. The deafened patient's lot is always improved when tinnitus is no longer part of the picture, and auditory acuity is not infrequently increased as a result.

Even when missing teeth have been replaced by artificial dentures it cannot be taken for granted that there has been no loss of vertical height. It is possible that the dentures were not constructed properly in the first place. While in all cases, since alveolar resorption is a continuous—albeit individual—process, it is quite possible that dentures which originally fitted well no longer fit as they should.

Deafness due to dental defects is at first conductive. Later, if it is not corrected, secondary nerve degeneration occurs also. Fortunately, if the etiologic factors are recognized promptly, deafness of this origin is reversible: reconstitution of the normal vertical dimensions in turn corrects the abnormalities of the mandibular condyles. We have in our files records of gains of as much as 25 db. in patients who have had no treatment except correction of the bite.

*Radiotherapy.*—Crowe's work with radon in deafness caused by lymphoid hyperplasia is another form of treatment which received mass confirmation in World War II. Let me briefly review it. His audiometric and other studies on children showed (1) that a surprising number without visible evidence of deafness, or with only slight evidence, had lost their hearing for high tones (above high C), while retaining their hearing for low tones; (2) that children subject to frequent colds were most likely to show this type of auditory impairment; (3) that their hearing disability could be traced to the presence of lymphoid tissue which blocked the eustachian tubes and interfered with middle ear ventilation; (4) that even when adenoid tissue had been removed at operation, it sometimes grew back and produced these effects; (5) that if the condition was not corrected, one octave after another might be affected, so that eventually half or more of the hearing in both ears might be lost, even for the middle range of spoken tones.

For this type of deafness Crowe figured out a remedy, the application of radon. If treatment were instituted early enough, the hearing loss could be completely reversed; while even if it were instituted late, there

were many cases in which the progression of the loss could be checked.

The Air Force in World War II was suffering a heavy loss of man power from aerotitis caused by lymphoid hyperplasia when it was realized that the principles of treatment devised by Crowe were entirely applicable to this situation. The next step was the development of an applicator to contain radium element (50 gm.) and suitable for use in the limited space in which the application had to be made; radon, of course, was quite impractical for military needs. The final step was the examination of all aviators to confirm or exclude the presence of excess lymphoid tissue and the use of radium in cases in which it was present. How many flying personnel were restored to usefulness by this method I suppose will never be known, but those of us in the Hearing Clinic can testify to its usefulness in civilian otology, particularly in children. It might be added, however, that before radium is applied, it is a wise plan to test the child to determine whether lymphoid hyperplasia is on an allergic basis. If it is, therapy directed to that etiology should be given an adequate trial.

*Narcosynthesis.*—The Army experience in World War II showed clearly the value of narcosynthesis, in the hands of a competent psychologist, in cases of deafness which have arisen on a functional basis or in which there is a functional overlay.<sup>6</sup> The mass trial of this method at the Hoff General Hospital Aural Rehabilitation Center showed that about three-quarters of the carefully selected group of patients who were thus treated had a complete return of hearing or a great improvement in auditory acuity, both clinically and audiometrically, even though in some cases the deafness had been present for ten years and more. The number of patients likely to be benefited by narcosynthesis is small, and its contribution to the major problem of deafness is correspondingly small, but our own limited experience at the Hearing Clinic is in accord with the Army experience with this method: Its proper application in cases in

which it is indicated can produce brilliant results.

#### REHABILITATION

*Hearing Aids.*—The provision of hearing aids is one of the most important and one of the most controversial activities of any hearing clinic. Berry,<sup>7</sup> in 1947, estimated that there were in the United States some 800,000 persons who used hearing aids, though he would have expressed it more correctly if he had said that this number had purchased hearing aids. Half or more of all persons who buy prostheses never use them, or use them only briefly or transiently, for a variety of reasons, of which the following seem to be the most important:

1. Perhaps the aid was not needed. A person with a loss of 20-40 to 20-45 db. need scarcely go to the trouble and expense of securing an aid. His hearing will be sufficiently improved by training in residual hearing and in the attention factor. A person with a loss of 70 db. or more will derive so little benefit from the use of an aid that his time and energy would be better spent in learning lip-reading. The person with a loss of 40-70 db. represents the type of deafened person who will be greatly benefited by the provision of an aid if it is properly selected and constantly worn, and if he is properly trained in its use.

In this connection it should be pointed out that the occupation of the deafened person should be taken into consideration in determining his need for a hearing aid. A student or a professional or clerical worker needs one. A farmer or a laborer might manage just as well without one. A machinist working in a noisy factory would do better without one. Incidentally, other things being equal, noisy work should not be recommended for a person with defective hearing.

2. Hearing aids are frequently unsatisfactory because they have not been properly selected. Many, if not most, aids are secured in about the same manner that the purchasers would have purchased any other commodity, that is, without proper medical and technical supervision. I have the highest respect for the work that has been done



by the various companies which manufacture hearing aids, and I am in no way impugning their good faith when I say that their salesmen should no more be entrusted with the selection and fitting of hearing aids—which is in effect the prescription of aids—than opticians should be entrusted with the selection of lenses. In fact, there is even less logic in their being entrusted with this task. The eye has an accommodative mechanism, and the provision of appropriate lenses restores vision. The ear has no similar mechanism, and a long-deafened ear simply does not adjust itself immediately to the sudden amplification of sound produced by the application of a hearing aid. It should be the task of the otologist, aided by experienced technicians, to determine the ear to be fitted, to prescribe the proper kind of aid (air conduction or bone conduction), and to settle other matters in connection with the choice of an aid. Many otologists have pointed out that commercial companies would lose nothing, and indeed would benefit in the end, if they would devote themselves to the production and constant improvement of hearing aid and would leave the selection and fitting to those qualified for these tasks.

3. A final reason why hearing aids are unsatisfactory has to do with the fitting, or rather the nonfitting, of the ear piece. This is a fact apparently not realized by those otologists who do not insist upon individually fitted ear pieces or by the commercial companies which provide only the stock insert. There is a difference of as much as 20 db. in the accuracy of reception secured with custom built and stock ear molds. Unless the mold fits perfectly, leakage occurs. When leakage occurs, sounds which reach the middle ear are weaker, and to compensate for the weakening, a higher acoustic output must be used. It is well known that the higher the acoustic output, the less is the sensitivity of the instrument and the less satisfaction the user will have with it. The squeal of acoustic feed-back is another result of leakage which is not generally appreciated.

A hearing aid is not properly fitted un-

less, in the making of the ear insert, possible retraction of the mandibular condyles is taken into consideration. When the condyles are in their normal anatomic location and the function of the mandibular joint is correspondingly normal, movement within the external auditory canal is at a minimum. When the condyles are retracted, movement increases with the degree of retraction. A recollection of these facts will make clear how important it is to determine, in the fitting of the air insert, whether malocclusion exists and retraction of the condyles has followed.

Anderson, Manion and Cota's<sup>8</sup> studies at the Eye, Ear, Nose and Throat Hospital make clear how little attention is generally paid to this consideration. An examination of 48 consecutive hard-of-hearing patients who wore hearing aids showed that malocclusion was present in all but 20 per cent, of such a degree that abnormal movement of the mandibular condyles was easily demonstrable. In some instances the discomfort on eating or coughing was so great that the ear inserts had to be removed during these activities. Yet careful inquiries elicited the fact that in not a single one of the 48 patients had the state of the teeth been taken into consideration in the fitting of the aids. Well over half of the patients who wore aids expressed themselves as dissatisfied with them, and it seems reasonable to assume that the source of at least part of their dissatisfaction was failure to correct malocclusion.

*Auditory Training.*—Classes in lip reading and voice training form part of the scheduled activities of the Hearing Clinic. Far more important, however, is auditory training, whether it takes the form of conservation of residual hearing, or instruction in the use of a hearing aid, or simple training in the factor of attention. Many persons who are far from totally deaf might as well be because they suffer from what Macfarlan<sup>9</sup> has well termed "auditory listlessness." They do not hear well enough to make it worth their while to listen. They find the effort of listening fatiguing, and as they make fewer attempts to hear, their

hearing becomes more and more impaired, suffering, for all practical purposes, from the atrophy of disuse. Auditory listlessness cannot be precisely charted. It is largely an individual matter, being closely related to the patient's natural perceptive abilities, mental alertness, and previous education and experience. With some persons it may occur when the hearing loss is 20 db. or even less. With others it may not occur until the loss is 30 db. or more.

The conservation of residual hearing is far more useful to the deafened patient than any amount of training in lip reading. Moreover, it preserves the natural ability of the deafened person's own voice, which is an extremely desirable result.

No hearing aid will be as satisfactory as it should be until the wearer is thoroughly trained in its use. The Army experience furnished particularly convincing proof of this fact and Silverman<sup>10</sup> and others have had similarly convincing experiences in civilian practice.

Training in the use of a hearing aid includes the gradual development of tolerance for amplified sound, refinement of discrimination of speech sounds through amplification, social and vocational adjustments, and the actual mechanics of wearing and caring for an aid. It also includes encouraging the patient to wear his aid constantly. As Hughson and Thompson<sup>11</sup> have pointed out, deafened persons who express themselves as unqualifiedly satisfied with their aids will almost always be found to be persons who are wearing their aids at all times.

#### THE DEAFENED CHILD

I want to comment particularly on the work we are doing with children at the Hearing Clinic. Modern technics require that they be treated as early in life as possible. If their deafness is not identified, and if treatment and training are delayed until they are 5 or 6 years of age, or older, they begin their education with a handicap because they are behind the children of their own age in language usages and appreciation. We have fitted hearing aids on children as young as 3 years, and our re-

sults with preschool children form one of the most rewarding phases of our work.

Auditory training is of great value in children who are congenitally deaf. These children, it has been shown, usually have some degree of residual hearing which, if properly fostered and brought up, can become really useful. We have the necessary equipment for this purpose at the Hearing Clinic and we have had some surprisingly good results in this group of children.

Examination of all children from the standpoint of possible lymphoid hyperplasia is another field in which mass prophylaxis would yield brilliant results. A hearing loss of 9 db. is definitely measurable, and a loss of this amount, while it causes no immediate hearing difficulties, is a warning signal. Retesting at intervals is indicated in such cases, while in more advanced cases treatment with radium by the Crowe method, or with appropriate measures for an allergic etiology, can check the pathologic process and will often result in full auditory ability.

It is extremely important that the parents of a deafened child be carefully instructed in the direction of his activities and training. Training the parents, in fact, is one of the most important phases of the child's rehabilitation. Some clinics such as the John Tracy Clinic in Los Angeles will not accept the child without the mother.

Let me give you an illustration of how a child would be treated in the Hearing Clinic. Here is a 7 year old boy whose nerve deafness is quite evidently the result of the induction of labor by quinine in his mother, who was an elderly primipara with impending toxemia. Quinine induction of labor, as you probably know, is the cause of nerve-deafness in a surprising proportion of cases, and a regrettable proportion, since the condition is entirely irreversible. In the truest sense of the words, the child is born deaf.

This boy's deafness was detected in school, when he was found to have language difficulties; his parents had noted them but had apparently not appreciated their significance. He could not say certain sounds,



"s," "th" and "p," for instance, because he had never heard them. He was found to be a surprisingly competent lip-reader, an ability which he had picked up in school, but he was frequently inattentive, as might have been expected, because he simply did not hear enough to keep him interested.

We shall treat this child with nucleoprotein combined with thiamine, the nucleoprotein being a new preparation just now undergoing clinical testing. We know that it cannot reverse the nerve damage, but we hope that it may prevent further degeneration. We shall see to it that the child's ability to read lips is improved in the special classes held for this purpose as part of the work in the public schools, and he will receive auditory training and speech training in other classes; in the brief time he has been under treatment his speech has already improved considerably. We shall fit him with a hearing aid and train him in its use. He will be watched at school, to be sure that he is seated where he can best hear what is going on, and his progress will be checked frequently with his teacher. Finally, his mother has already been carefully instructed in how to direct and manage him at home.

This is a bright, attractive child, and I have no doubt that if he continues under the joint care of the staff of the Hearing Clinic and of the very competent and enthusiastic staff of the Medical Department of the Public School System, he can be guided successfully through school and into a useful occupation afterward. What might have happened to him if his decided hearing disability had not been discovered is so obvious that I need not expatiate on it.

#### SUMMARY AND CONCLUSIONS

This is, in brief, the story of what the Hearing Clinic at the Eye, Ear, Nose and Throat Hospital has accomplished and is trying to accomplish. At the present time we are operating under the difficulties imposed by the construction under way at the hospital. When the work is finished, we shall have additional space. That will not, however, solve our financial problems. The resources of the hospital are limited and

they must, of course, be spread in many directions. The Hearing Clinic cannot expect from the hospital much more than it is now receiving. Yet it cannot function without minimum expensive equipment, particularly electronic equipment, for which there is no acceptable substitute, or without additional personnel.

With additional funds, there is a great deal that we could do. We could expand our research program, which at present is small because of limitations of money, equipment and personnel. It would be highly desirable if we could increase the number of internes and residents now in training. This is a much needed field of usefulness. Lederer<sup>12</sup> is probably correct in his estimate that at the present time less than 1 per cent of all otologists are qualified to handle cases of deafness by the new technics. Finally, at the present time, because of limitations of facilities and personnel, we are able to admit only six patients each week to the Hearing Clinic. We are, I think, doing a good work with the means at hand, but until we can increase our present intake many times over, we shall be making only an infinitesimal contribution to the problem of deafness as it exists in this city and state.

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## DISCUSSION

Dr. Hartwig M. Adler (New Orleans): I agree with Dr. Alexander that you can't do an accurate evaluation of hearing other than by the audiometric method. At the Metairie Country Day School, one of the teachers does a psychometric examination on all the children entering that school. This is more difficult than doing a whispered and spoken voice test. It should be possible to train teachers, who teach reading, or elocution, in the lower grades to do a more or less accurate screening of their pupils' hearing with spoken and whispered voice tests. The apparently hard of hearing ones could then have their hearing more accurately evaluated by audiometer.

Dr. L. W. Alexander (New Orleans): The testing of very young children is one of the biggest problems we have today. There are very few men who have worked out anything very satisfactory at the present time. I have just recently received some tests that have been worked out in Northwestern University for testing pre-school children. Men doing a great deal of this research are finding a great difficulty in making a very accurate test with these children.

The big problem as I see it is the case-finding. Once you have found the case, the case should be sent to an otologist who has the means at his disposal to really make a diagnosis. Does that answer your question, Dr. Adler?

Dr. J. D. Martin (Baton Rouge): I would like to tell Dr. Adler that I deliberately did not discuss technics of testing, because I feel that is the otologist's prerogative. I think our job is case finding through every method we have available, then when we have found a child that we suspect of having a hearing loss, we should refer that child to the proper authority for competent medical and other examination to determine whether or not our suspicion is correct.

I would like to stress very much lymphoid hyperplasia, as a cause of deafness in children; I would like to stress it particularly because it is extremely common, and it is associated with allergy and upper respiratory infections. It is one of the causes most amenable to adequate treatment early, and one which all of us as general practitioners should recognize and refer to competent medical authority for treatment and follow-up care.

Dr. J. W. McLauren, an otorhinolaryngologist who expected to be here today told me in his experience, and he has been very much interested in audiology, that 90 per cent of the children that he is able to help by treatment, are children who have a lymphoid hyperplasia causing their deafness.

Dr. Alexander (In conclusion): Some other tests will have to be devised. The whispered voice is not accurate; it depends on the quality of the whisper, the loudness of the whisper; it also depends on the person, some whisper very loud, and others whisper very softly. You have so many fac-

tors to take into consideration. I think it will be solved in the future.

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## THE PUBLIC HEALTH ASPECTS OF DECREASED HEARING IN CHILDREN

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The hard of hearing child is one of the most pathetic, appealing, and yet neglected problems of modern medicine. Today many children with decreased hearing can be benefited by proper therapy administered early, but unfortunately many of these youngsters never receive proper therapy early enough for benefit. In 1945 Walter Hughson,<sup>1</sup> now dead, said: "The greatest stumbling blocks to adequate therapy are the pediatrician and family practitioner. The reasons are a lack of understanding of the problem and an unwillingness to admit an inability to deal adequately with the situation once it has been demonstrated."

The purpose of this paper is not to deal with the purely medical aspects of decreased hearing in children, but to reaffirm that this is a major public health problem and that it is remedial and partly preventable.

Here at the onset of this discussion I wish to differentiate between the deaf child and the child with decreased hearing. The deaf child is one whose hearing is of no practical value for the purpose of communicating with others without special instruction in order to acquire articulate speech. This child is provided for in special programs, whereas the child with decreased hearing is neglected. The hard of hearing child is one who learned to speak casually and unconsciously from speaking persons around him by hearing them, but whose hearing is not as acute as it should be, however, and therefore, he does not learn to speak properly. Faults may occur in pitch, rhythm, voice quality, articulation, or language, even though the neuromuscular mechanism for speech may be in-



tact. Every hard of hearing child has an associated speech defect and these speech defects should be our clue to investigate that child's hearing acuity. The main difference, therefore, between the deaf, the hard of hearing, and the normal hearing child is language and the older the child at onset of hearing loss the better the prognosis for good speech.

What constitutes decreased hearing? There is no unanimity of opinion here, but all of us are aware that between the extremes of good hearing and deafness is a transitional area in which the various degrees of decreased hearing shade imperceptibly into one another. Obviously, however, a decrease in hearing which does not affect a child's personality or his ability to perform the duties inherent to his state of life is only of theoretical importance or perhaps prognostic significance. If however, the decrease in hearing is sufficient to affect his personality or impair his adjustment, then it is a real problem for him. The important thing is not the decrease in hearing, but the child's adjustment to his handicap. A child with a severe hearing loss, but good adjustment is no problem, but a child with even a slight decrease in hearing and poor adjustment represents a major psychologic, social, and medical problem.

How extensive is this problem of impaired hearing? Estimates range from 5 per cent<sup>2</sup> to 8-10 per cent<sup>3</sup> of children attending school. For the sake of evaluation on the conservative side the low estimate of 5 per cent is accepted as being nearer accuracy; that means that 5 per cent of the children attending school in the United States, or about 1,500,000 children, and to bring it closer home, 5 per cent of the children attending school in Louisiana, or about 33,000 children, have decreased hearing, and are in need of medical care and special educational assistance.

The major causes of decreased hearing are the infectious and contagious diseases of childhood, especially scarlet fever, meningitis, and measles,<sup>4</sup> malocclusions, pronounced lymphoid tissue growth at the

openings of the Eustachian tubes,<sup>5</sup> and repeated upper respiratory infections. The percentage of children with decreased hearing is also much greater in underprivileged areas where conditions of poverty, poor housing, and undernutrition exist.<sup>3</sup> If we keep in mind the etiology of decreased hearing, the danger of severe hearing loss can be avoided in many instances by proper diagnosis at the time of the onset of the precipitating cause. Hearing loss is most remedial in its incipency; the longer it persists the more apt it is to become fixed. With continued neglect the decrease in hearing increases and the chance of recovery is decreased. If we are to progress in hearing conservation, we must suspect the possibility of decreased hearing resulting from the acute infectious and contagious diseases of childhood, and from infections of ears, nose, and throat, and we must institute preventive treatment early.

The manifestations of a decrease in hearing acuity which should make us realize that further study of the child is necessary are: frequent ear pain; running ears; reporting of hearing noises in the ear; retardation in class work; speech defects; inattention and frequent mistakes in carrying out instructions; habitual failure to respond when questioned; failure in school in those subjects which require oral explanation or discussion either by the teacher or the class, but excellence in those subjects which require handedness skills and less hearing.<sup>6</sup>

Nothing can take the place of a high index of suspicion, a desire to find these handicapped youngsters, and our diagnostic acumen in recognizing them; however, we will be considerably aided in our work if we will organize a good case finding program using all available methods of detection.

The best approach in case finding is recognition by the parent that something is wrong with the child. This approach is easily defeated, however, if the physician to whom the parent turns for advice fails to recognize the significance of the abnormal manifestation. Teacher observa-

tion is also good, but has the same limitation. The teacher should associate: retardation in educational achievement;<sup>7</sup> emotional instability;<sup>7</sup> behavior problems; grade repeaters; inattention; requests for assignments to be repeated; peculiar listening posture; talking in too low a tone of voice; irrelevant answers; restlessness and evidence of fatigue; a spotty educational record with poor work in those subjects that require hearing the spoken voice,<sup>3</sup> together with those manifestations mentioned earlier with a child having deficient hearing.

For mass case finding surveys the audiometer is increasing in popularity. There are two types of audiometers: the phonograph-speech audiometer and the pure-tone audiometer. Of the two, the pure-tone audiometer is the most practical and useful. While it is possible to test 40 children at one time with the phonograph-speech audiometer and only 1 at a time with the pure-tone audiometer, Charles E. Kinney<sup>3</sup> of Cleveland is of the opinion that approximately the same number of children can be screened in a given time by either method and he prefers the sweep-check method with the pure-tone audiometer because it eliminates rescreening, particularly of the low intelligence cases, the poor groupwork cases, and the poor or slow writers, and most important, it picks up those children with high frequency losses and these last are not identified by the phonograph-speech audiometer.

At first thought the audiometer would seem to be the answer to our case finding problem, but do not forget that like all mechanical devices, it has its limitations and should be only an adjunct to and not a substitute for diagnostic acumen. As with any other mechanical testing device, it only tells what the condition is at the exact moment that the test is made. It will pick up many cases of temporary decrease in hearing during and following upper respiratory infections, and it will not differentiate between temporary and permanent hearing loss. Also, unless used by a skilled operator, a child who thinks can outsmart

it. In spite of its limitations, however, each year finds it more extensively used as a case finding tool and it is doing a good job. An ideal screening program provides that each child is tested annually, but in many school systems this is not possible. In systems where annual audiometric testing is not possible testing should be done as often as possible. In addition, the ideal program provides for an audiometric test for each child who has had a communicable disease six weeks after the child is over the acute illness. This case finding service should be offered if at all possible in all school systems.

Let us not forget either that case finding is not our objective; our goal is complete rehabilitation of the child maladjusted as a result of his decrease in hearing acuity. To attain this objective an adequate follow-up program, medical, psychological, educational, and social, is needed. Our job is to help the child adjust to his handicap and guide him to become a useful, self supporting, happy member of society.

Aside from our love for children and our obligation to protect their health and guide them to becoming socially adjusted, there is an economic reason why every effort should be made to conserve hearing. As a child's hearing loss increases, his ability to keep up scholastically with the average hearing child decreases. Madden<sup>8</sup> states that there is no difference between normal hearing and hard of hearing children as far as attentiveness, obedience, and social attitude is concerned, but the hard of hearing are rated lower in leadership and aggressiveness. Bonnell<sup>9</sup> reports that partially deafened children repeat grades about three times more than all other children and that the deafened child who finished the 8th grade will repeat between two and three times, at a total expense to the taxpayer of between one hundred and two hundred dollars. If we accept the conservative estimate that 5 per cent of school children have decreased hearing, then 50 of every 1000 children have decreased hearing. The cost to the taxpayer of these



children repeating two to three grades before completing the first eight grades is considerable. Bonnell<sup>9</sup> says that as expensive as it may appear to buy audiometers, to make careful periodic hearing tests and to follow up the handicapped children, and to see that proper medical steps are taken, it is even more expensive to handle the repeaters whose impaired hearing may escape notice until it has become severe and chronic. Examinations by means of an audiometer reveal over ten times as many cases of partial deafness as former routine medical examinations uncovered. Bonnell,<sup>9</sup> also, points out two significant economic facts: (1) Medical treatment, lip reading instruction, the use of hearing aids and more favorable seating should cut grade repetition by at least 50 per cent. (2) There is increased adult earning power for those children who are saved by early treatment from becoming severely deafened later in life.

If rehabilitation will do so much for the child and the taxpayer, it is well to know how it is accomplished. When a child is found to have decreased hearing, he should be referred immediately for competent medical and dental examination to determine the cause of his decreased hearing and, if possible, eliminate the cause. If removal of the cause does not restore the child's hearing an evaluation to determine the extent of his hearing loss, its status, and his adjustment to his handicap, should then be done so that a proper program of rehabilitation may be instituted. The evaluation of the child's decrease in hearing and its effect on the child should be the result of study by an aurist, a speech therapist, a clinical psychologist, and an educator trained to work with hard of hearing children.

When the evaluation study is completed, plans are made for active rehabilitation. Rehabilitation of a child involves more than rehabilitation of an adult, but the process is easier because of the greater adaptability of youth. The earlier the decrease in hearing is discovered after onset, and the later in childhood the decrease first

becomes noticeable, the better the prognosis for adjustment and good speech. In addition to a knowledge of how much of a decrease in hearing a child has, it is most important to know what he can do with what hearing he has. A mental measurement to determine his mental potentialities is essential in planning the child's program. Van Adestine<sup>11</sup> stresses this and is of the opinion that some children have more hearing than they make use of so as to cover up the slowness of their mental operations and thus evade the responsibility to learn something. Assuming that the child has been properly diagnosed, we next must determine what adjustments are necessary to permit the child to progress normally with his class of normal hearing children. The hard of hearing child has three traits which favor his adjustment.<sup>12</sup> These are: (1) the ability to concentrate because he is not disturbed by talk or other sounds; (2) an intense wish to make good on any job; (3) adaptability.

Following diagnosis the children should be grouped according to the severity of their handicap.<sup>13</sup> Children with minor losses need only be referred for medical examination and periodic follow-up. Children with minor but significant decreases in hearing should be seated closer to the teacher. A child with a severe loss in one ear only should be seated so that the good ear is toward the teacher and the class. A child with decreased hearing in both ears should be seated toward the front and instructed to watch the lips of the teacher. During class discussion this child should be permitted to change his seating as needed in order to follow the discussion. Children who cannot get along by special seating alone should be given lip reading instructions. Children with severe bilateral hearing loss who have difficulty keeping up even using lip reading should be given special education in small classes in the regular school. In these classes hearing aids should be available and instruction should be personalized. This last is most important.

In addition teachers should discipline

themselves to assist these children as much as possible and always be patient with them and understanding of their difficulties. In addition the teacher should always stress clear enunciation on the part of the pupils and should personally practice it.

The number of children needing lip reading instruction represents about 1 per cent of the total school population. Lip reading is not difficult, but like any art, it requires constant practice to maintain proficiency. Lip reading is the art of understanding what a person is saying by watching the movement of his lips and tongue. Lip reading facility enables children with decreased hearing to keep pace with their normal hearing companions and decreases the number of children who have to repeat grades. In addition to assisting a child to recognize what others are saying lip reading develops alertness, concentration and self assurance, and all of these contribute to social adjustment.

A child with a slight decrease in hearing which will progress will need lip reading as badly as another child with a substantial decrease in hearing. How should children be selected for lip reading classes? McNutt<sup>10</sup> says the number of decibels of hearing loss is not the only criterion for determining need of lip reading instruction. The same degree of hearing loss may be a definite handicap to one child and very little to another. Other factors influencing the need are: the type of deafness, the child's school achievement and social adjustment and the otologist's recommendation.

If a hearing aid is indicated, a child is never too young to use one, but the hearing aid must be selected by an audiologist to fit the child's personal needs and it must never be so powerful as to damage his residual hearing. It must also be borne in mind that some types of ear trouble may be aggravated by the use of a hearing aid. To buy any hearing aid is therefore not only unwise, but may be dangerous. A properly fitted, necessary hearing aid in addition to improving the child's hearing acuity assists him in retaining and improv-

ing his speech and keeping his voice normal.

Hand in glove with every hearing conservation program, therefore, should be a speech therapy program. Voice training is a real need and every school system should employ one or more trained, competent speech therapists.

Now so far we have talked about recognizing and providing for the child with decreased hearing but we have not yet said anything about a positive prevention program. It is far better to prevent than cure and the field of hearing conservation is a fertile ground for a good preventive program.

Prevention of hearing loss, as with all other preventive medicine programs, is based on professional and parental education. Physicians, parents and children must know what diseases are likely to impair hearing. Physicians must teach parents and children which infectious diseases frequently spread to the ears and they must also instruct them in methods of preventing this spread. Parents should know and understand the importance of competent medical care early in infectious diseases and must be educated to seek medical advice.

A program to educate principals and classroom teachers to good health knowledge and practices should be a part of their basic training. In the schools the health practice should be in accord with accepted medical practices. Teachers and principals should exclude from school children with upper respiratory infections. Classrooms should be properly ventilated and the temperature should be regulated so as to avoid extremes. Teachers should watch for children with damp clothes or wet feet and provide for them until the clothes and shoes are dry.

The job for those interested in hearing conservation is not yet complete even though we have just talked about a preventive program. Our goal is reached only when the hearing impairment is corrected, or if this is not possible, when the child approaching adulthood has had all of the



rehabilitative measures mentioned above and then receives specialized job training and is placed in a job where he is self supporting, has taken his rightful position in society and society has accepted him.

In conclusion, I would like to summarize the high points of the public health aspects of the hard of hearing child. Hearing conservation can not be a spasmodic affair; it must be a long range program based on the realization that prevention through education is better and less costly than correction; that if damage has already resulted that medical research has demonstrated that at least half of the children with early manifestations of decreased hearing can be cured with proper treatment of the causative condition and many others can be helped;<sup>3</sup> that rehabilitation starts as early in life as it is possible to discover the decreased hearing and that it continues through the school years until the handicapped person is completely adjusted to his handicap and is accepted by his normal companions in society on an equal footing.

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#### DISCUSSION

Dr. Hartwig M. Adler (New Orleans): I'd like to ask Dr. Martin if he has made any attempts to standardize spoken voice and whispered voice tests, which can be used on the children by the teachers, who are instructing them in the schools. Among my experiences in the Army, I spent my last eleven months doing the EENT examination of men, who were being discharged, and asking whether they could hear with spoken and whispered voice test. My experience convinces me that if the teachers in the elementary grades, who are teaching the children how to read and speak, were taught some simple rudiments of whispered and spoken voice tests, they could fairly well screen these children, and decide who can hear and who cannot, in the "play-game" fashion.

Dr. J. D. Martin (In conclusion): We haven't done any of that work in Baton Rouge for two reasons. It has been abandoned where audiometric tests are being done because of the greater ease and accuracy of audiometric testing, and second because in school work verbal or spoken voice tests are unsatisfactory. There is a great deal of noise in the classrooms in schools, and in the hands of untrained persons, such as the ordinary teacher, vocal tests give a most inaccurate idea of the child's ability to hear. There are also other extraneous factors that affect vocal testing. If you had no other method of detecting hearing loss in the child, I would say that vocal testing would be justifiable. I think as an adjunct to other things it could be used.

Probably a little more satisfactory would be just the ordinary ticking of a watch, if you use the same watch on a large number of children and the tick didn't vary in intensity, and you took the normal distance at which the majority hear the tick, I think it would be a little more accurate method. I would believe a more satisfactory means of suspecting hearing loss, however, would be the manifestations that I mentioned earlier, such as inattentiveness, habitual requests to repeat questions, behavior problems, and things of that sort.

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## STATE SOCIETY OFFICERS FOR THE YEAR

The membership of the Society and the House of Delegates are to be congratulated upon the officers selected for the current year.

Our President, Dr. George W. Wright of Monroe, is admirably suited to the duties of an office which are arduous, time consuming, and require an exquisite nicety of judgment. Dr. Wright, as President-elect the past year, has been able to render invaluable service to the Society and to the cause of medicine as a whole. He has also served in the past as president and Councillor of the Fifth District Medical Society. His great experience in the field of medicine as

a prominent internist, and his broad contact with the doctors of the whole State endowed him with additional qualities which are going to be most valuable in a year which we all feel will be one in which crucial decisions against state medicine will have to be made. As this is an election year, it is quite clear that the issue of state medicine and Socialism will be before the voters and in the Congress afterwards. It will be the duty of every member to assist Dr. Wright and to cooperate with him in the strenuous efforts this campaign will entail.

Dr. Edwin H. Lawson becomes Past-President, and as such will continue to make available his judgment, experience, and wide talents for the benefit of the Executive Committee.

The President-elect for the year, succeeding Dr. Wright's term, is Dr. Edwin L. Zander. The Society is most fortunate in having Dr. Zander as President-elect at this time. He brings to this position and to the Executive Committee long experience in the Orleans Parish Medical Society as President and in other capacities. In addition, he has served as chairman of the Committee on Congressional Matters for years with great effectiveness and distinction. His contact with the problems of organized medicine has been broad, and his opportunities for service have been many. The membership should feel very happy in this selection.

The First Vice-President is Dr. U. S. Hargrove of Baton Rouge. Dr. Hargrove has been active in the affairs of the East Baton Rouge Medical Society, and to most excellent purpose. The members have great pleasure in thanking him for the conclusion of a most satisfactory and successful convention in which the arrangements were made for the comfort and benefit of all.

The Second Vice-President is Dr. J. Kelly Stone, whose service in the Orleans Parish Medical Society and in the various matters and conflicts that have been associated with the efforts of the Society to combat state medicine and to promote voluntary insur-



ance brought to the executive council mature judgment and broad experience. He will be a new and valuable member of the Executive Committee.

The Third Vice-President is Dr. Guy Riche of Baton Rouge. Dr. Riche has long been active in the East Baton Rouge Medical Society, and well known there for his maturity of viewpoint and his long experience as a practitioner.

Dr. A. V. Friedrichs was selected as Chairman of the House of Delegates, as he has been since 1944. The members of the House of Delegates admire the smoothness and dispatch with which he assists them in getting through a volume of business which would take many deliberative bodies several days to accomplish. His breadth of vision and impartiality in the administration of that most important office are appreciated by all.

The Vice-Chairman of the House of Delegates is Dr. J. P. Sanders of Shreveport. He was again elected to serve in this capacity, and his counsel and experience in the Executive Committee are highly respected. He has had broad experience as a practitioner, and recently as the result of his leadership in the Academy of General Practice, and as Vice-Chairman of the

Rural Health Committee, and his advice will be most useful in the Executive Committee.

Our experienced and resourceful Secretary-Treasurer, Dr. P. T. Talbot, continues in office and will as always provide the Executive Committee, the members, and all inquirers, with excellent, mature, and accurate advice in the matters that affect organized medicine. His unselfishness and sincerity will long be appreciated.

The Council will remain the same as last year, with the exception of Dr. Ashton Thomas of New Orleans, who becomes Councillor for the First District, indicated by the election of Dr. E. L. Zander as President-elect. Dr. Thomas has had wide experience in organized medicine and has served its interests faithfully and for many years in various offices in the Orleans Parish Medical Society and as a member of the Board of Health for the City of New Orleans. He will be a valuable member of the Council.

The coming year promises to be one that will tax the capacities of all the officers and all the members of the State Society. The officers selected will discharge their duties with satisfaction and effectiveness. They will need the full cooperation of the entire membership.

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## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### 1950 ANNUAL MEETING

The Annual Meeting of the State Society, held in Baton Rouge April 24-26 proved to be one of the most interesting and well attended in the history of the organization. The Committee on Arrangements, composed of members of the East Baton Rouge Parish Medical Society, rendered excellent service in handling preparations for the meeting and all details were taken care of

in a very able manner. There were 437 members, 36 guests and 55 exhibitors registered and all agreed that this was an outstanding meeting.

The House of Delegates held two sessions and for information of the members reports of the President, the Committee on Medical Defense and the Committee on Resolutions, with action taken, are printed below. Further data will be carried in subsequent issues of the Journal.

## REPORT OF PRESIDENT

Your State Society has devoted the major portion of its efforts during the last year in overcoming numerous attempts made by various pressure groups to socialize, or federalize, the practice of medicine. In doing this these groups introduced a subtle plan to convert the whole of industrial and professional life into a welfare state. Just imagine the great problem that we are now facing with these astute politicians on one side with substantial resources and a great deal of expert legal action to help them put into effect legislation which would destroy not only the great practice of medicine in this great country, but the free enterprise system under which we have grown and prospered. Druggists, nurses, professional men, and women alike would be ruined by such a measure. We must continue to fight those people with alien concepts who seem determined to drive us down the hill to socialism and communism (Reference: John T. Flynn's *The Road Ahead*). We are obtaining good results in our fight. Indeed, it was this Society, not just the officers and committeemen, but also the 1,848 members that helped defeat the President's (and Mr. Ewing's) reorganization Plan No. 1. The work to accomplish this defeat alone received the highest commendation of the American Medical Association, and Louisiana was one of the five states given credit for defeating this piece of socialistic medical enactment. There have been other federal bills involving medical practice, principally HR 6000 which is for the expanding and increasing of benefits to a larger number of clients in the Social Security Agency; *The Social Security Expansion Bill*, HR 1453; *The Federal Aid to Education Bill*, HR 5940; and S. 1411, *Medical Care for School Children*, all of which have been opposed with some success. Most of these bills are now in the hands of committees for release, and some of them are still having hearings.

To muster sufficient opposition against the above measures has required the support of the officers, committees and every

member. The various members of committees, the officers, and all the members of the State Society have displayed great loyalty and a desire to aid the State Society in every respect to make their opposition a success. They have also contributed quite a large sum of money for the financial support of the Society for this purpose. For all of this we wish to thank you, and to state that while we are doing everything we can to hasten the day of final success, no one can predict with certainty how soon such a day will arrive. One thing certain is that we have to continue this fight now until we do win!

In June, 1949, the American Medical Association had its meeting in Atlantic City and outlined twenty points for lay sponsored voluntary insurance groups (known as the Co-ops). After careful study some of these principles were found unsound and difficult to enforce. Many of the doctors of the South, Southwest, and West were opposed to some of these principles and found them to be unsound. Therefore, a conference was held in July, 1949, in Little Rock, Arkansas, where the presidents and delegates from Arkansas, Oklahoma, Texas, Mississippi, Kentucky, Tennessee and Louisiana met. Your president and one of your AMA delegates, Dr. J. Q. Graves, attended this meeting. The result of this conference was the formation of a Western and Southwestern group of representatives of the various state societies concerned, whose objectives were in accord, and especially to provide a means to secure a closer understanding by cooperation between the state societies concerned and the AMA, relative to proposed and existing legislation. These representatives met in a conference in Denver, Colorado in August and this Society was represented by the President-elect, Dr. George Wright, and the Secretary-Treasurer, Dr. Paul T. Talbot. The third meeting convened in Oklahoma City, Oklahoma, and the State Society was represented by Dr. George Wright. This meeting was held just prior to the introduction of S. R. 147 and to it may be particularly ascribed success in passage of



this Senate Resolution. There were quite a few procedures necessary to follow in order to have S. R. 147 passed, which was done by an outstanding Senate vote of 60 to 32. A later meeting of these major groups of doctors was held in Denver in February, 1950. This meeting was attended by Dr. George Wright, President-elect, and Dr. P. H. Jones, Editor of the Journal. This meeting was held principally to formulate plans of procedure to oppose HR 1453, "The Social Security Expansion Bill". In February the AMA held a conference in Chicago where the State Society was represented by Drs. Wright, Friedrichs, Zander and Hattaway.

In addition to these conferences representatives from the Congressional Committee have attended meetings and conferences in Washington and Chicago. Officers and delegates have attended meetings of the AMA House of Delegates at the regular and interim sessions. These conferences dealt with current matters of grave importance to the medical profession. Your Society has been represented by members appearing on the programs of various civic clubs and their presentation of the views of the State Medical Society to members of these clubs, the majority of whom are laymen, has informed the public of the interest and constant attention of your State Society to the welfare of the public. The Council on Medical Service and Public Relations has been most energetic in sponsoring and promoting conferences, addresses and other activities in an effort to defeat federalized medicine. Dr. A. V. Friedrichs, a member of this Council, in conjunction with other members in the Parishes of Tangipahoa, Iberville, and Grant have established school health programs as pilot tests in an attempt to follow out the requests of the AMA. The Council has been most active in promotion and extension of voluntary health insurance as offered by the Louisiana Physicians Service. In reference to the latter it will be noted that this company has progressed to the point of needing more room, and also requiring full time services of a director. The part-time secretary employed by the Council has also become a

full-time employee of the Louisiana Physicians Service.

The great increase of work as mentioned above has also doubled or quadrupled the amount of work necessary in our executive office, and especially in the office of our Secretary-Treasurer. At the last meeting of the Executive Committee it was unanimously voted to secure an assistant to the Secretary who shall be a physician, and a committee was appointed for this purpose. It is hoped and respectfully urged that the House of Delegates take similar action in order that we may hastily take care of this increased work which is so important to the future of our profession. With an assistant such as this, the Secretary of the State Society could secure closer cooperation between the State Medical Society office and the various component medical societies and with various national and regional conferences. Such an individual could also greatly assist the Council on Medical Service and Public Relations.

During the past year the overlapping of the duties of various committees was particularly noticed and careful observation of the list of committees with their purposes, indicates an over-abundance of committees. This is particularly apparent in the activities of the Rural Health Committee, the Congressional Committee, and the Council on Medical Service and Public Relations. At the present time there is a special committee appointed to review this particular situation and it is hoped that the members of the House of Delegates will give this particular issue careful consideration.

I cannot complete this report without availing myself of this opportunity to express my sincere appreciation to Dr. Talbot and his associates for their advice and knowledge of the society policies. No one, unless having close contact with the office of the State Society, can conceive of the valuable service the Secretary and his assistants are rendering our organization.

#### *Recommendations*

1. It is recommended that a licensed physician be employed to act as Assistant Secretary-Treasurer.

2. It is recommended that the number of committees be reduced and the work of those remaining be definitely outlined and coordinated, thus preventing an existing overlapping of purposes.

EDWIN H. LAWSON, M. D.,  
President.

*Action taken*—The following report of the Committee on the President's Report was adopted: The Committee on the President's Report wishes to accept the report as a whole and to approve the two recommendations contained in the report. We wish to commend particularly that part of the report referring to the necessity of continuing the fight against socialized medicine.

#### COMMITTEE ON MEDICAL DEFENSE

In October, 1949, two cases were submitted to the Committee on Medical Defense. Both of these were approved for defense and the attorney for the Society advised accordingly. One of these, a threatened suit against a New Orleans physician, is still pending. The other, filed against a doctor of Lafayette, was settled by compromise after approval for compromise was secured from the Committee on Medical Defense and the doctor in question.

Suit has been filed against a New Orleans physician who, while in the employ of a university, handled a case in Jackson, Mississippi, through the Mississippi State Board of Health, which was not terminated to the satisfaction of the patient. The Committee considered defense of this case and came to the conclusion that the member should receive defense; however, it was agreed that such defense should be offered jointly by the State Medical Society and the university in question and the attorney for the State Society is proceeding in this manner.

The Budget and Finance Committee and the Executive Committee have reviewed financial reports of the Medical Defense Fund and these are on file in the office of

the Society for review by any member who may wish to see them.

C. B. ERICKSON, M. D.,  
Chairman.

Action taken—Report accepted.

#### REPORT OF COMMITTEE ON RESOLUTIONS

Baton Rouge Louisiana, House of Delegates,  
1950 Annual Meeting  
Gentlemen:

On behalf of the House of Delegates and members of the State Society in attendance at the 1950 annual meeting, it is recommended that thanks be expressed to the following individuals and organizations for their participation in this meeting:

Dr. U. S. Hargrove, Chairman of the Committee on Arrangements, for his splendid cooperation in guiding the local committee in preparations for the meeting.

The East Baton Rouge Parish Medical Society, our excellent host for the meeting.

Dr. P. T. Talbot, Secretary of the State Medical Society, for his usual interest and activity in handling details previous to the meeting, although physically handicapped.

To the Secretaries employed by the State Society for their loyal cooperation.

Dr. Donovan C. Browne for his efforts in arranging the scientific program, which was of great interest to all present.

Hon. Senator Russell Long, annual orator, for his valuable and interesting address at the opening session of the meeting.

Hon. William J. Dodd, Lt. Governor of Louisiana, for his words of welcome.

Guests on the scientific program for interesting discussions.

The press and radio stations for space and time devoted to publicity for the meeting.

Secretary of the Louisiana State Board of Medical Examiners for his informative report to the House of Delegates.





## WOMAN'S AUXILIARY OF THE LOUISIANA STATE MEDICAL SOCIETY

Doctor's Day was observed throughout the state with various forms of entertainment in honor of the physicians. The Calcasieu Auxiliary held a dance at the Majestic Hotel and the Ouachita Auxiliary gave a dinner at the Lotus Club. In Rapides Parish, Baptist Hospital and the Auxiliary jointly had a coffee party in the morning at the Hospital and presented each doctor with a red carnation boutonniere. Lafayette and Jefferson Davis Auxiliaries also had parties for the doctors.

Mrs. John S. Dunn, president of the State Auxiliary, made her annual visit to East Baton Rouge Auxiliary in March and was the principal speaker at their luncheon meeting.

Winners in the Hygeia essay contest, sponsored each year by the Calcasieu Auxiliary, were announced recently by Mrs. Walter Moss, chairman of the Hygeia Committee. The winners are Clara Viator and Curtis Duplechain from the Sulphur elementary school; Beverly Jane Graham and Wayne Fleming, West Lake school; John Sorrells, LaGrange school; Valda Gasse and Jimmy Rollins, DeQuincy school; Ann Mylius and Johnny Pecorino, Central school; and Donna McCurnin, Immaculate Conception. Seventh grade students of all Calcasieu Parish schools were invited to participate in the contest. The essay consisted of 300 words on a topic taken from Hygeia. Teachers selected the six best essays from each class and the Hygeia Committee chose the winners. Each winner was awarded a prize of \$2.00.

At the April meeting of the Orleans Parish Auxiliary, Dr. Max M. Hattaway addressed the group on "What Organized Medicine is Doing to Improve

Medical Care." The Orleans Parish Auxiliary donated \$25.00 to the Cancer Fund and also contributed \$25.00 to the State Auxiliary Commemoration Fund.

Registration of doctors who attended the 5th district Cancer Seminar was done by the Ouachita Parish Auxiliary.

At the March meeting of the Jefferson Davis Auxiliary, Mrs. Louis Shirley was the principal speaker. She chose as her topic "Jane Todd Crawford-Pioneer Heroine of Surgery."

A family has been "adopted" for one year by the Lafayette Auxiliary. The family which resides in Lafayette Parish consists of the parents and seven children who range in age from 1 year to 15 years. The father is a tenant farmer who is a surgical patient at Charity Hospital and who will need further surgery. The Auxiliary has agreed to send monthly contributions for food and to be responsible for the medical needs of the family. Individually, members of the Auxiliary will give canned goods, clothing, and shoes throughout the year. On holidays such as Easter, Thanksgiving and Christmas, the members will supply the family with appropriate gifts.

The 27th annual meeting of the Woman's Auxiliary to the A.M.A. will be held in San Francisco, June 26 to June 30. Headquarters will be at the Hotel Fairmont. A copy of the program may be obtained from Auxiliary's Office, 535 N. Dearborn Street, Chicago.

MRS. DANIEL M. KINGSLEY,

Chairman, Press and Publicity

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## BOOK REVIEWS

*Clinical Laboratory Methods and Diagnosis:* By R. B. H. Gradwohl, M. D., D. Sc., F. R. S. T. M. & H. (London) St. Louis, The C. V. Mosby Co., 1948, pp. 3148, Illus., Price \$40. 3 vols.

This is the fourth edition of this text by Dr. Gradwohl, who on this occasion has had the collaboration of other investigators to produce such voluminous work that it has been divided into three volumes.

The first volume, entitled Urine, Blood, Gastric Analysis, Puncture Fluids, Feces, and Special Tests, covers comprehensively the greater number of commonly used technics involved with notations of the common sources of error. A fuller explanation of the principles involved in the above technic is recommended.

Volume II deals with Bacteriology, Serology, Post-mortem examinations, Tissues, Museum Toxicology, Crime, Basal Metabolism, and Electrocar-

diography. The section on Bacteriology is fairly comprehensive and offers an excellent fundamental treatise on this subject. The remaining portions of this volume as specified are more or less only outlines of the various procedures to follow.

Volume III, entitled Parasitology and Tropical Medicine, gives a brief history of the development of parasitology with a pertinent classification and definition of terms used. The section on malaria employs the Spanish classification and appears to be taken almost entirely from Kouri and Basneuv's text of Parasitology and Tropical Medicine. The illustrations are very good, some being photographic, others drawings. The tables, particularly on malarial parasite development, are not in accord with the ideas of all investigators.

The whole text is an excellent encyclopedia of laboratory technic brought up to date.

E. H. LAWSON, M. D.



*Modern Clinical Psychiatry*: By Arthur P. Noyes, M. D., 3d ed. Philadelphia 5, W. B. Saunders Co., 1948. pp. 525. Price \$6.00.

This is the third edition of this standard student-text since 1934. Well indexed, it conveniently provides pertinent bibliography at the end of each chapter. Dr. Noyes continues to remain on as solid ground as he can find in psychiatry, and although he presents the current concepts of psychopathology and dynamics, he does so with a critical scientific attitude and takes no sides. Dr. Noyes is still presenting schizophrenia in essentially Meyerian terms, i.e., "not as an autonomous disease entity, but as a type of reaction in certain personalities as a result of conflicts or complexes and a progressive difficulty in adaptation." He cites Kraepelin's and Bleuler's postulations of a structural-organic basis for the disorder but does not mention the more recent psychosocial-genetic concepts.

The "War Neuroses" are discussed with too much emphasis on the catastrophic combat reactions and too little on the vastly more common chronic anxiety reactions, hysterical reactions, and somatizations of everyday war service which fill most of the Veterans Hospitals' psychiatric beds today. Probably, too, many an ex-World War II medical officer familiar with the medical history of World War I will be astonished to learn that "Effort Syndrome" rarely occurred in World War II.

The chapter on psychopathic personality is quite elucidative for the non-psychiatrist in its presentation of the "Psychopathology of the Psychopath". Its breakdown of the Kraepelin and Kahn classifications of psychopathic personality, however, is as unnecessary as the classifications are superficial. Unfortunately, no mention is made of the Menninger classification of Pathological Personalities (Psychopaths) into schizoid personality, inadequate personality, etc., and this reviewer would consider the omission a serious defect, both because the terminology is the expression of a newer concept and is used by all Armed Forces medical departments and Veterans Administration hospitals and clinics, and because the problem of psychiatric nosology is an acute one, particularly to the record librarians of psychiatric hospitals. At the conclusion of the chapter Dr. Noyes mentions the Ganser Syndrome (nonsense syndrome) and cautions the reader that it should be distinguished from malingering. Under the psychoneuroses, he definitely terms it an hysterical reaction. It is wondered if many psychiatrists who have long dealt with criminals or medical pension-seekers still consider this syndrome "hysterical".

All in all, it is a good text for the student, the general practitioner, and the non-psychiatric specialist. The latter two, who so commonly express

aversion for psychiatric jargon, will find this text reads easily for lack of it.

H. THARP POSEY, M. D.

*Handbook of Medical Management*: By Milton Chatton, A. B., M. D., Sheldon Margen, A. B., M. D., and Henry D. Brainerd, A. B., M. D. Univ. Medical Pub., 1949. 1st ed., 476 p. Price \$3.00.

This handbook should prove of value where most recent and effective therapeutic measures for prompt and continued treatment are sought.

The data, though outlined, are easily grasped and are at once usable.

I. L. ROBBINS, M. D.

*Occupational Marks; and Other Physical Signs*: By Francesco Ronchese, M. D. Grune & Stratton, 1948. Illus. Pp. 181. Price \$5.50.

This very interesting monograph should be enjoyed by any physician having the slightest avocation for deduction. Dr. Ronchese has organized and presented his material in a brief and concise manner so that the entire volume can be read in about one hour. More than half of the text consists of photographs which excellently illustrate the subject matter.

Dr. Ronchese demonstrates the many advantages of well-trained powers of observation. From a medical viewpoint, occupational marks that are immediately recognized as such often prevent an incorrect diagnosis or treatment; as for example psoriasis or keratoderma, in cases of callosities. In criminology, personal identification is frequently of inestimable value. Knowledge of occupational marks will also aid in establishing the social strata of the individual.

This monograph would seem to be especially valuable to all dermatologists who are called upon to diagnose and treat many of the stigmata of occupation or hobby. Shortly after reading this volume I had occasion to see a violinist's mark under the chin, a handwriting callus of the first phalanx of the middle finger in a clerical worker, and also, a callosity produced by scissors in a ribbon cutter. In every one of these cases treatment would be of no value unless the etiology were understood and in some cases corrective measures taken to prevent recurrence.

GEORGE GAETHE, M. D.

*Human Nutrition*: By V. H. Mottram, M. A. (Cant.) Baltimore, Williams & Wilkins Company, 1948. Pp. 267. Price \$2.75.

This splendid little book on human nutrition, designed particularly for dietitians, is well planned and delightfully written. Facts are presented

clearly and interestingly in an easy somewhat conversational manner. It is refreshing when a scientific book retains accuracy and precision and yet has distinctive style and reflects the author's individuality and experience. The book deals largely with basic knowledge of the science of nutrition but includes many practical suggestions for applied dietetics. Among the subjects discussed are the role of calories, proteins, minerals, and vitamins in nutrition, digestion, absorption, and metabolism of foods, effects of cooking, processing, and storage on foods, and normal dietetics. This book should be useful to medical students as well as to dietitians, as a simple, accurate and up-to-date introduction to nutrition.

GRACE A. GOLDSMITH, M. D.

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*Pathology*: Edited by W. A. D. Anderson, M. A., M. D., F. A. C. P., Professor of Pathology and Bacteriology, Marquette University School of Medicine, Milwaukee, Wisconsin. C. V. Mosby Co., 1948. Illus. Pp. 1453. Price \$15.00.

This book has already established its position as an essential volume in the libraries of both pathologists and clinicians. Pathology, as have other branches of medicine, has expanded to such a degree, that the standard textbook is often inadequate. This book while following the pattern of standard texts has some 33 contributors who write with authority in their own special fields. It contains much more material than the average text and is an invaluable reference source. Of particular value are sections on special pathology, such as on skin by Arthur Allen, the organs of special sense by J. E. Ash, and bones and joints by Granville A. Bennett. Too often such important areas in the field of pathology are minimized in standard texts. Of necessity, in a work of this sort, there is some loss in homogeneity and continuity. Some sections are more thoroughly covered than others. On the whole, however, the balance is good. For sophomore students of pathology it is perhaps more detailed and voluminous than desirable in a beginner's text although as a supplementary text it is admirable. The bibliographies are excellent. Some of the omissions and minor errors inevitable in first editions undoubtedly will be rectified in later editions. We noted, for example, that there was almost no reference to sarcomas of the soft parts.

W. H. STERNBERG, M. D.

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*General Endocrinology*: By Clarence Donnell Turner, Ph.D., Philadelphia. W. B. Saunders Co., 1948. Pp. 604. Price \$6.75.

Experimental biology is presented as a fundamental aspect of biologic science, rather than as a medical specialty. Believing that the field of

endocrinology can no longer be restricted to the study of a circumscribed set of ductless glands in the higher vertebrates, the author has broadened it to include comparable structures in lower and higher vertebrates. The regulation of growth processes in plants by compounds of a hormonal nature is also integrated.

Following the introductory chapters on the scope of endocrinology and biology of secretion, the glands of internal secretion, gastrointestinal principles, biology of sex and reproduction, hormones in pregnancy and lactation, and endocrine mechanisms in the invertebrates are presented from an experimental point of view.

Few clinicians have any conception of the varied and extensive research on this subject. In each chapter one finds revealing basic information as well as provocative experiments on the physiology of the endocrines.

The subject is regarded as the science of chemical coordination of the organism and this text is recommended to students preparing for medicine and allied branches as well as those interested in research on endocrinologic problems.

EUGENE H. COUNTISS, M. D.

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*Clinical Biochemistry*: By Abraham Cantarow, M. D. and Max Trumper, Ph.D. Philadelphia, W. B. Saunders Company, 1949. Fourth Edition. Pp. 641. Price \$8.00.

The latest edition of this excellent standard elementary text follows in order and emphasis the treatment of the subject in the earlier editions, but attempts to keep abreast of the rapid advances made in recent years. There has been some revision of the sections devoted to acid-base balance, carbohydrate, lipid and protein metabolism, thyroid function, adrenal functions, vitamins, and experimental diabetes, with the inclusion of much new material in diagrammatic and chart form, as well as significant additions to the well chosen bibliography that follows each section of the book.

Newly added material includes consideration of chemical changes in shock, thymol turbidity and flocculation, fatty liver, lower nephron nephrosis, potassium in the treatment of diabetic coma, goitrogenic agents, and new methods of studying adrenocortical function. The text has been kept to the same length as the previous edition, and is superior to it in physical make-up.

A. O. KASTLER, Ph.D.

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#### PUBLICATIONS RECEIVED

University Medical Publishers, Palo Alto, Calif.: *Handbook of Obstetrics and Diagnostic Gynecology*, by Leo Doyle, M. S., M. D.

Charles C. Thomas, Publisher, Springfield, Ill.: *Treatment in Psychiatry*, by Oskar Diethelm, M.



D. (Second Edition); The Nose; An Experimental Study of Reactions Within the Nose in Human Subjects During Varying Life Experiences, by Thomas H. Holmes, M. D., Helen Goodell, B. S., Stewart Wolf, M. D., and Harold G. Wolff, M. D.; Chemical Developments in Thyroidology, by William T. Salter, M. D.; B. C. G. Vaccination in

Theory and Practice, by K. Neville Irvine, D. M., M. A.

Grune & Stratton, Inc., New York: Progress in Clinical Endocrinology, edited by Samuel Soskin, M. D. (Second Edition).

Northland Press, Saint Paul: SAW-GE-MAH (Medicine Man), by Louis J. Gariepy, M. D.

# New Orleans Medical and Surgical Journal

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## THE PROBLEM OF PRIMARY DYSMENORRHEA\*

EMIL NOVAK, M. D.  
BALTIMORE, MD.

The problem of primary or intrinsic dysmenorrhea, the menstrual pain so often observed in the entire absence of any anatomic abnormality of the pelvic organs, is one of the oldest in gynecology, and yet we do not seem much nearer a solution of its etiology than our predecessors of a hundred years ago. The disorder is often spoken of as a minor gynecologic ailment, but it probably causes a greater aggregate of human pain than almost any other disease or disorder of the pelvic glands. Pain is not a normal symptom of menstruation, although a moderate degree of pelvic heaviness and a slight bearing-down in the lower abdomen is not infrequent, and may be considered within the limits of normality.

Dysmenorrhea of this type is often stated to begin with the menarche, but this is not always true. In cross-examining patients on this point I have been impressed with the frequency with which, when their memory is prodded, these patients will say that for a time after inauguration of the function, sometimes a few months, sometimes a year or two or even more, the periods were painless. The reason for this is that in a considerable proportion of girls the menstrual cycles are of anovulatory type, i. e., ovulation does not begin in such girls until a considerable time after the beginning of

menstruation. There is now abundant evidence that this is true, not only in the human, but also from studies on the monkey, in which the phenomena of menstruation seem practically identical with those observed in women.

The mere fact that a girl, or a monkey, begins to menstruate at a certain age does not necessarily mean that fertilization is possible. Most frequently it is, since most often ovulation does actually occur with the first menstrual cycle. It has now been established that it is in these ovulating girls only, though of course in only a certain proportion of them, that the so-called primary dysmenorrhea is noted. To drive this point a bit further, we must recall that it is the anovulatory type of cycle which is most unstable, that an aberration of this incomplete type of cycle is responsible for the functional bleeding of puberty and adolescence, and that girls with this sort of bleeding characteristically complain of no pain.

The above mentioned observation is a rather paradoxical one in view of the fact that estrogen is accepted as the hormonal cause of uterine contractility, and that the common concept of dysmenorrhea is that it is due to colicky and exaggerated contractions of the uterine musculature. And yet in the very girls who have an abnormally persistent and unopposed estrogen production, pain is absent. On the other hand, progesterone has been in the past looked upon as a relaxant of muscular contractility, although there are now many who question this. In any event, in the ovulating women in whom only proges-

\*Summary of address presented at the Thirteenth Annual Meeting of the New Orleans Postgraduate Medical Assembly, March 6, 1950.



terone is present, severe dysmenorrhea is often observed. This is an apparent paradox for which a satisfactory explanation is not yet available. When it comes we shall have taken a big step in the elucidation of the problem of dysmenorrhea.

It is this study of the hormonal factors in uterine motility and contractility which, some twenty years ago, appeared to make dysmenorrhea an endocrine problem, and which led to various forms of endocrine treatment, most of which have more recently been almost abandoned. As a matter of fact, we still cannot be sure that the mechanism of the disorder is actually a muscular one, though this is suggested by the clinical character of the pain. The latter, however, could be explained just as plausibly if we postulated that the primary cause is a spasm of the spiral arteriolar blood vessels which play such a fundamental role in menstruation. There have already been efforts at treating menstrual pain by various vasodilator drugs, but thus far these reports are too few and too unimpressive to justify any enthusiasm.

Before the advent of the endocrine concept of menstruation the chief theories as to the etiology of dysmenorrhea were as follows:

1. *Obstruction of cervix.* This theory dates back to 1932, when Mackintosh first reported the relief of menstrual pain by dilatation of the cervical canal, a procedure which was universally employed for a hundred years or more, and which is still practiced by some gynecologists. Stenosis of the canal, or angulation by sharp ante-flexion of the uterus, were quite generally held to be the important causes of dysmenorrhea. It is hardly necessary to elaborate on this theory at any length, as it has been completely disproved for dysmenorrhea in general, although it is still true that it may be an occasional factor.

2. *Constitutional factor.* Not many will dispute the fact that the lowering of the threshold of pain which results in constitutional debilitating disorders of any kind may be a factor in inaugurating or exaggerating menstrual pain, and that in some

cases the latter is relieved simply by improving the general health by a proper hygienic regime, recreation, hematinics when indicated, and other such constitutional measures.

3. *Psychogenic factor.* There are some gynecologists who flatly consider that dysmenorrhea is always of psychogenic causation, a view to which I do not subscribe. On the other hand, it is certainly an important factor in many cases. Even if not the primary cause in a given case, there is no doubt that the dysmenorrhea can be perpetuated and exaggerated by the superimposition of a psychogenic factor. If, in other words, the girl has long had menstrual cramps, she subconsciously expects pain with each period, and thus is quite sure to have it. Not a few cases are due to lack of instruction, or wrong instruction, of young girls approaching puberty. Mothers are sometimes prone to caution the girl about what not to do during the period, without stressing the normality of the function and the fact that it should not normally hurt the girl's activities to any appreciable extent. The girl thus coddled is likely to look forward to menstruation with dread and as a time when she will really be "unwell". Under such conditions, and especially if the mother or an older sister goes to bed at each menstrual period because of dysmenorrhea, it is an easy transition for the young girl to become a dysmenorrheic herself. There is little doubt as to the importance of such psychogenic factors as this in a proportion of the cases, but, by contrast, one sees even severe dysmenorrhea in girls of the most phlegmatic temperament, in whom it would be very far-fetched to invoke any such psychogenic element as an etiological factor.

It is evident that no one explanation can be applied to all cases of dysmenorrhea, that any of the factors mentioned above may play a part, and that all must be envisaged in the management of such patients. It is possible and indeed it is probable, that some much more direct and intrinsic mechanism, whether muscular, vascular, or perhaps some other expression

of endocrine unbalance, may some day be discovered, and that it may be found to represent a sort of common denominator of other more superficial causes. Should this day ever arrive, the treatment can be expected to be much more direct and specific than it now is.

#### MANAGEMENT

What has been said above as to the possible etiological factors in primary dysmenorrhea will serve to indicate the principles of treatment, admittedly still far from being altogether satisfactory in its results. These principles may be summarized somewhat as follows:

*Milder cases.* In many patients the menstrual pain is of moderate severity and is limited to the first day of menstruation, sometimes lasting only a few hours. Aside from the constitutional measures which are always in order, and such psychosomatic measures as reassurance of the patient as to the lack of any serious significance of the menstrual pain, it seems to me that nothing is necessary other than such simple analgesics as codeine and aspirin. It would seem foolish to subject patients with such short-lived discomfort to any form of endocrine therapy.

*Moderately severe cases.* There are numerous patients in whom severe pain begins from one to several days before menstruation, and persists for from one to several days of the flow, and in whom bed rest of a day or two is necessary with every cycle. Incidentally, patients of this group should be encouraged to avoid going to bed if possible, if for no other reason than the psychological one of avoiding a deepening of the mental rut of menstrual invalidism. Again every advantage should be taken of the constitutional and psychosomatic approach, though the results are all too often disappointing.

The two hormones which in the recent past enjoyed wide vogue in the treatment of dysmenorrhea were progesterone and testosterone. It seems hardly worth while to discuss their supposed rationale, since this has been brought into serious question and since the results of such treatment

have been so unimpressive that it has been almost abandoned. About the only hormonal treatment which has retained a limited but very definite niche is that which makes use of estrogen in the pre-ovulatory phase. The purpose of this treatment is the inhibition of ovulation for the particular cycle, and there is no doubt that this can be readily accomplished in most cases. By thus abolishing ovulation, the next menstrual period is quite likely to be a painless one, usually to the joy and surprise of the patient, who thus finds that she can actually menstruate without pain. In spite of the transitory nature of this relief, it gives the patient a genuine psychologic boost, and the importance of the psychologic factor is never to be minimized or overlooked in the management of any case of such a subjective disorder as dysmenorrhea.

The estrogen most commonly employed in the attempt to convert the ovulatory into the painless anovulatory one is diethyl stilbestrol. A dosage of 1 mg. tablet nightly, beginning on the first or second day of a period and continued for about 14 doses, is likely thus to make the next flow a relatively or completely painless one. Some use much larger dosage, but this seems unnecessary and inadvisable because of the greater disturbance of both the rhythm and amount of the periods which it produces. Even the smaller dosage above mentioned is likely to produce minor menstrual irregularities and quantitative variations of the flow, but the patient should be prepared for this, and she will not mind the irregularity if she obtains relief from the pain. The repetition of the plan during the succeeding month may again give relief, but not always as striking as with the first. There are some who continue this treatment indefinitely, but it appears better to employ it in an intermittent fashion for only two or three months in succession, depending upon simple analgesics in the untreated cycles, but always hoping that the psychologic factor will bring about improvement even in these.

It would be silly to suggest that this



treatment is anything more than a useful addition to our armamentarium in the management of at least some dysmenorrheic patients. It is also quite obvious that the method should not be used, except perhaps occasionally, in the case of dysmenorrheic married women who are anxious to become pregnant. The frequent abolition of ovulation would certainly not be conducive to this ambition. The estrogenic plan of therapy must therefore be regarded as of limited value and applicability, but when resorted to I believe it to be more frequently helpful than any other method of endocrine treatment I have employed.

*Severe and intractable cases.* Regardless of any combination of constitutional and psychosomatic measures, analgesics or endocrines which may be employed, there is unfortunately a residuum of patients, numerically not large, who continue to suffer so severely that more radical therapy must be considered. One cannot expect a woman to continue suffering with dysmenorrhea so severe that she can not hold any kind of job or which is threatening her whole morale. In this comparatively small fraction of the total cases of dysmenorrhea, the operation of presacral sympathectomy, if properly performed, may be expected to give relief in about 70 per cent of cases, though the figure is put much higher by some. While the operation is usually fairly simple, it is an abdominal procedure, and one which is therefore not altogether without hazard. It has always been my feeling that it is too quickly resorted to by some gynecologists, and even more by general surgeons, without full preliminary employment of nonsurgical measures which can usually make the lot of a dysmenorrhea patient at least tolerable.

Efforts to differentiate a uterine from an ovarian type of dysmenorrhea, and to perform ovarian neurectomy instead of or together with the presacral procedure in certain cases, as suggested by O'Donnell Browne, have not appeared to make much impression on American gynecologists, and there is room for skepticism as to the cri-

teria upon which such classifications are based.

#### SUMMARY

Whatever the actual mechanism of primary dysmenorrhea may be, and whether it be of primarily muscular, vascular, or some other character, its subjective nature makes other contributing or even causative factors important, especially those of psychogenic and constitutional nature. All these factors must be envisaged in the clinical management of primary dysmenorrhea. The physician who does not make full use of psychosomatic and constitutional measures, and who depends only on endocrines, falls far short of the requirements, and he is likely to have few successes. Endocrine therapy has, in the main, been disappointing, but the estrogen plan, with the purpose of inhibiting ovulation at least intermittently, is a worthwhile adjunct in the management of a good many cases of dysmenorrhea. The limitations of the plan are discussed in the paper.

Dysmenorrhea per se is not an indication for presacral neurectomy, which should not be resorted to until a full trial is made of more conservative, nonsurgical measures. Under these conditions it is fully justified and helpful in the great majority of cases.

The management of this troublesome problem of primary dysmenorrhea is a pretty good test of the clinician's knowledge, intelligence, common sense, thoroughness, and conscientiousness.

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#### ANALYSIS OF TREATMENT IN PRIMARY DYSMENORRHEA\*

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Dysmenorrhea is probably the most frequent complaint the gynecologist encounters in his everyday practice. Primary dysmenorrhea makes up a large percentage of these cases. Incidence varies from Emge's 2.8 per cent of women to Lakeman's 89.6 per cent. In a review of 115 gynecological cases in my practice the past year 74.78 per cent complained of dysmenorrhea, of which

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only 19.13 per cent came in for relief of this monthly agony. The other 75 per cent probably were resigned to their fate or whatever relief they might be able to obtain from home remedies. Estimated on a time loss or economic basis, Haman has stated that the time lost due to this disorder is three times that of the generally considered greatest timewaster—the common cold. In spite of the fact that it is encountered so frequently, that it is by no means a recently described symptom complex, (Ayur Veda made note of menstrual pains 1000 B.C., and Hippocrates advocated cervical dilatation for its relief 400 years B.C.), and there has been a magnitude of study devoted to the subject, all explanations as to its cause must be considered conjectural.

The following is an analysis of the suggested therapy by numerous authors over a period of years to the present date.

#### DIET

Every comprehensive discussion of the subject of dysmenorrhea stresses the importance of an adequate diet. Some recommend a low carbohydrate diet while others suggest the elimination of certain protein constituents from the meal. In spite of all the general references to the diet, there is no satisfactory explanation of the benefits or harm that may be derived from the corrected diet. Regarding an adequate diet, most of these patients are fairly well developed and well nourished individuals; at least, there is no universal type habitus. Since insulin has relieved some of these individuals, a disturbed carbohydrate metabolism was felt to be present. This disturbance, however, cannot be present to any great degree since blood and urine studies fail to reveal abnormal findings. The elimination of protein, either on an empirical or allergic basis fails to show any conclusive evidence as offending in most individuals, either in sensitivity tests or other manifestations. Tyson did show, however, in a few definite allergy cases that the presence of an urticarial rash was aggravated during the menstrual period, and this was relieved by the administration of benadryl. I personally recommend to these patients a light

diet for several days to a week preceding the menses. By decreasing the intestinal contents, distention, peristalsis, and vascular engorgements are decreased and the result may be of some benefit. Since constipation is frequently an accompanying complaint, a laxative is recommended twenty-four hours before onset of expected menses. The frequently associated nausea and vomiting seem to be greatly benefited as a result of these measures.

#### EXERCISE

For many years the literature on dysmenorrhea made general statements as to the beneficial effects that might be derived from outdoor exercises. However, in recent years more comprehensive study has been conducted, with specific types of exercises fully described in print. Billig felt that dysmenorrhea was due to postural defect of contracted fascial ligamentous bands, restricting posterior tilt excursion range of the pelvis in rotation to the legs and back. During menstruation, with the change in ovarian hormone balance, the ligaments further shortened causing impingement with irritation of the peripheral spinal nerves passing through and by them. With this theory as the cause of dysmenorrhea, he devised a series of postural exercises to stretch these ligamentous structures, removing the irritation to the nerves, and thus relieving the pain. Billig particularly stresses the ilioinguinal and iliohypogastric nerves as being affected. If this were true, one would expect more superficial pain and also more lower extremity discomfort. On the basis of his explanation, it is difficult to explain entirely the deep seated midline pain which is nearly always present and the frequently associated backache. Yet, not only were his results from the use of these exercises excellent, but Haman's modification of the same exercises obtained perhaps a higher percentage of relief in primary dysmenorrhoeic individuals than that obtained from any other method or combination of methods, exclusive of castration. He obtained 90 per cent relief in individuals with primary dysmenorrhea. Since girl athletes and swimmers are usually free



from menstrual pain, one might conclude that Billig's theory is sound. To investigate further, I interviewed 8 professional dancers none of whom took the specifically prescribed postural exercises. Their regular body maneuvers should have been sufficient to overcome any ligamentous contracture that might have been present. Of the 8 interviewed, 6 professed no menstrual pain. This would surely add weight to Billig's explanation. If the postural exercises are beneficial, one would imagine that knee-chest exercises would also be beneficial, especially in retrodisplaced uteri which may produce traction on the supporting ligamentous structures and circulatory disturbance. In addition to the specific exercises, one might also recommend walking as a general measure to stretch ligamentous structures, increase muscular tone, and promote good circulatory function.

#### REST

Adequate rest, both mental and physical, is of paramount importance, especially at the time of menses. Fatigue, possibly by lowering the pain threshold, may evoke symptoms, or at least aggravate those already present. It has been felt by many that fatigue apparently plays an important part in this condition. Several authors have considered it on occasion as a distinct entity which they called "Fatigue Dysmenorrhea." Because of the prominent role it may play in primary dysmenorrhea, the importance of avoiding fatigue premenstrually and particularly during the menstrual period should be emphasized to the patient.

#### HEAT THERAPY

Since the time of the Romans, the value of warm baths has been appreciated. Warm baths premenstrually and frequent warm showers during the menses are recommended for relief of pain so may it be beneficial here, in addition to its relaxing effect. Clow has reported reducing the incidence of dysmenorrhea in school girls by 70 per cent with the use of warm showers, adequate diet, and exercise. In view of the fact that many others have obtained favorable results with this simple measure, and because of its innocuousness, it is recom-

mended along with the other measures. Warm drinks, and the application of a heating pad to cramping areas are recommended. Warm enemas frequently bring very gratifying relief of symptoms. The thousands of pages written on heat therapy preclude any further discussion of this mode of therapy.

#### SALT

Since the retention of fluid in the tissues is apparent particularly at this time, as noted by the tenseness of the breasts, swelling of the abdomen, and occasionally, swelling of the hands and feet, the abstinence of sodium is insisted upon. Edematous, swollen pelvic tissues may easily evoke pain by pressure, traction, or irritation. Absolute salt restriction for the week preceding the onset of the menses is recommended. One of the salt substitutes may be prescribed.

#### DRUGS

Nearly every drug that has been available to the medical profession has at one time or another been administered for the relief of dysmenorrhea, those listed in the pharmacopoeia and the many not listed. Obviously, it would be impossible to review all of them, so only a few general comments will be made. Since kymographic studies have shown that antispasmodics have little relaxing influence on the uterus, these drugs should be of limited value. In addition to the lack of scientific confirmation of the beneficial effect of these drugs, there is lack of conclusive evidence that uterine spasm is the cause of dysmenorrhea. Uterine contractions recorded during painful menstruation are similar to those obtained in painless menses. The results from the different medicinal preparations are approximately the same regardless of the preparation. This is somewhat difficult to explain since they frequently have entirely different pharmacological action, except on a psychogenic background, or due to the fact that most of them also contain analgesics incorporated with the other basic drug which might act in raising the pain threshold. Upon interrogation of 27 patients in my practice suffering from menstrual pains, it was revealed that approximately as much relief was obtained from

the use of "patent medicines" as from the recognized ethical products. This would surely speak strongly for the psychogenic influence. Several of these individuals claimed considerable relief from the use of alcohol. This success is most probably the result of depressing the higher cerebral centers and making them less receptive to pain impulses. Also the danger of addiction is readily recognized. Although curare is supposed to act only upon the neuromuscular junction of voluntary muscles (striated muscle) and has no effect on sensory nerves, Florence Johnson administered 50-100 mgs. intravenously with immediate relief of symptoms. My personal experience with curare consists of only 4 cases. One patient obtained relief while the other 3 were little benefited. Marked weakness immediately followed, however, in all cases and lasted for sixty to ninety minutes.

#### ENDOCRINE THERAPY

Although the dysmenorrhoeic patient displays no consistent lowered B.M.R., thyroid, one of the originally discovered hormones, which has stood the test of time, is frequently given on a purely empirical basis. Progesterone, because of its supposed relaxation of the uterus, is recommended by many, including Smith, Smith and Schiller, who feel there is a decreased estrogen level as a result of decreased progesterone activity. Harding, however, felt that progesterone was ineffective but pregnenolone was effective and benefited 73 per cent of his patients by its administration. Since it is generally agreed that dysmenorrhea is associated with an ovulatory cycle an adequate amount of progesterone appears to be present in these cases, maturation of the graafian follicle with its ovum being impossible without sufficient progesterone stimulation. The presence of ovulation associated with this entity has recently prompted some to use large doses of estrogens and androgens in an attempt to suppress this function and relieve the symptoms of dysmenorrhea. Good results have been claimed by many. In spite of the relief obtained, it hardly seems justified, since other measures have given equally

good results. The treatment is contrary to the normal physiology, and the danger of the androgens producing masculinization from prolonged use is apparent.

Because of the supposed deranged carbohydrate metabolism, insulin has been given with varied success. However, neither blood nor urine studies in these cases show any marked variation from the normal.

Vitamins, with their structural formulae similar to the hormones, may have their place in the treatment of this condition: Vitamin B for its marked neurogenic effects: Vitamin E for its beneficial vascular response, and the remainder of the present known group for whatever deficiency may be present.

#### MISCELLANEOUS

Primary dysmenorrhea is most often found in the young nulliparous individual with long, closed cervix. Since pregnancy apparently cures, or at least greatly relieves, many cases, it would seem logical to follow Nature's pattern by some means of dilatation of the cervix. The late C. Jeff Miller once said that he obtained relief from symptoms in at least 60 per cent of his cases by simple office dilatation of the cervix with Hegar dilators. Many authors recommend dilatation of the cervix believing the pericervical nerves are crushed in doing so, thus relieving the symptoms. For prolonged dilatation several types of stem pessaries have been devised. Curtis cited one case in which he obtained complete relief for several months following tubal insufflation. Feeling that relief in this case may have been due to some dilatation of the uterus as well as the tubes, I attempted to dilate the uterine cavity by means of the distended portion of the Bordex catheter. This was left in for twenty-four hours. The following period was completely painless; however, the second onset of menses following the attempted dilatation was ushered in by the most excruciating pains the patient had ever experienced. In the dysmenorrhoeic patients on whom I have performed uterosalpingograms, no noticeable improvement has been noted following the procedure.



Israel and others have injected Frankenhäusen's ganglion with novacine and alcohol with variable and temporary relief. In 5 cases in which I have tried this procedure, 1 has been free of pain for three months while the other 4 have had a return of symptoms of practically the same degree as before injection was carried out.

Tyson reported relief from the use of benadryl in several cases in which severe dysmenorrhea was present with an urticarial rash that was considerably worse at the time of menses.

Grossman benefited 96.9 per cent of his private patients by the administration of depropanex, a deproteinized pancreatic extract with smooth muscle relaxing properties.

#### HYPNOSIS

With the variable results obtained with drugs and procedures of conflicting action, one would be forced to conclude that there is a considerable amount of psychogenic influence. The threshold of pain has been proved rather conclusively by Haman to be much lower in these individuals. Using the sensimeter, as recommended by Haman, on 18 dysmenorrhoeic patients and comparing the results with 18 other individuals, both male and female, my findings closely paralleled his—definitely lowered threshold for pain in the dysmenorrhoeic patient. Psychotherapy recommended by Wengraf, Kurzrock and others probably has a sound psychophysiological basis. Kroeger and Freed cured 7 out of 9 cases with hypnosis. I have had no personal experience with this method.

#### SURGICAL

The efferent sensory nerve fibers pass through the superior hypogastric plexus, frequently called the presacral nerve, transmitting pain impulses through Frankenhäusen's ganglion. This anatomic fact may explain some of the midline or uterine pain but not the bilateral or ovarianalgias described by some authors as the ovary derives its nerve supply from higher up in the inferior mesenteric plexus. If hypertonicity of the uterus causes increased stimulation of the nerve fibers, then these in-

dividuals we would imagine should have increased uterine tone during pregnancy with short labors. Actually, the reverse is true since the more primitive and hard-working individuals with no dysmenorrhoeic symptoms have the shortest labors. It is also the consensus of opinion among gynecologists that the severe postpartal pains of the multipara are due to the relaxed poor tone of the multiparous uteri. In spite of these arguments, a presacral sympathectomy with interruption of pain impulses from their origin to the sensorium should produce complete relief from uterine pain in all cases. Since Cotte reported performing 300 sympathectomies for primary dysmenorrhea with only 2 failures (Cotte reported over 1500 with only 2 per cent failures in 1949), many have been performed but none have obtained the high degree of success that he had. If it were not for the recognized ability of the American gynecologist reporting a fair number of failures, one would be apt to blame the failure on their faulty surgical technic.

#### CONCLUSIONS

1. In spite of the vast and lengthy study devoted to this condition, the problem seems far from solved.

2. The fact that so many different drugs and procedures of opposite reactions are reported with equal success is further evidence that the cause is still unknown and the cure still undiscovered.

3. The benefit obtained with the multiplicity of unscientific preparations, analgesic drugs, and unrelated procedures, gives increased credence to the prominence of the psychogenic influence in this condition.

4. Until this complex problem is solved, a multiple method and procedure regimen appears to be the best hope for the primary dysmenorrhoeic patient today.

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## THE DIAGNOSIS AND MANAGEMENT OF PATIENTS WITH CHRONIC RECURRENT HEADACHE\*

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Headache is one of the most common symptoms to which man is subject. There are few individuals who have never suffered from headaches on several or many occasions. It is a manifestation of febrile illnesses and of many systemic diseases as well as of diseases of the nervous system. Headaches may occur without any organic pathology or they may be a manifestation of serious disease. In the vast majority of cases the headaches are transient and their occurrence can be related directly to an acute febrile episode or some other cause. The situation is different, however, in those cases where the headaches are chronic or recur at intervals over a period of months or years. It is important in these cases to determine by a thorough study, the underlying cause of the headache in order to correct any serious pathology if such exists and in order to determine what form of therapy is indicated in those cases where no serious pathology is present.

It would not be possible to give a complete list of the causes of headache and this discussion will be chiefly with the more common forms of chronic or recurrent headaches. Headaches are a common manifestation of intracranial tumors and infections, head trauma, febrile illness, arterial hypertension, cerebral arteriosclerosis and cerebral anoxia and asphyxia of any cause. Other causes of chronic headache are diseases of the eye, nose, ear, and teeth. These

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conditions account for only a small percentage of the patients who consult a physician on account of chronic headaches. In the vast majority of the patients a thorough study will not reveal any significant findings which will explain their headaches. In these patients with headaches of unknown cause, the symptoms can usually be explained on the basis of either migraine or psychological tension (psychogenic headaches). Constipation and other chronic gastrointestinal disturbances are not, as is frequently stated, a common cause of chronic headache.

#### PATHOPHYSIOLOGY OF HEADACHE

The pain sensitive structures in the head are: The tissues covering the cranium; the large intracranial venous sinuses and their tributaries; the dura mater at the base of the skull; the dural arteries (anterior and middle meningeal); the large arteries at the base of the brain; the fifth, ninth, and tenth cranial nerves; and the upper cervical nerves. The substances of the brain, the small arteries on the surface of the cortex and the dura over the convexity of the brain are all relatively insensitive to pain.

Stimulation of pain sensitive structures on or above the tentorium results in pain or headache in front of a line drawn vertically from the ears across the top of the head. The pain is transmitted to the nervous system by way of the fifth cranial nerve. Stimulation of pain structures below the tentorium causes pain behind the line described above. The pain sensation is transmitted to the nervous system via the ninth and tenth cranial nerves and the upper three cervical nerves.

According to Wolff<sup>1</sup> there are six basic mechanisms of headache: (1) Traction on the veins that pass to the venous sinuses from the surface of the brain and displacement of the great venous sinuses; (2) traction on the middle meningeal arteries; (3) traction on the arteries at the base of the brain and their main branches; (4) distention and dilatation of intracranial arteries; (5) inflammation in or about any of the pain-sensitive structures of the head, and (6) direct pressure on the cranial and

cervical nerves which contain many pain afferent fibers from the head. One or more of the mechanisms may be operating in any given patient with headaches.

Headaches associated with disease of the intracranial structures (tumors, aneurysms, hemorrhage, meningitis, and other infections) are usually due to traction and displacement of the pain sensitive intracranial structures chiefly the large arteries, veins, venous sinuses and certain cranial nerves.

The headaches associated with fever, hypertension, anoxia, and asphyxia, nitrites, and foreign protein are usually due to distention and dilatation of the intracranial arteries.

Diseases of the extracranial structures in the head which may give rise to head pains and headaches include errors of refraction and inflammatory processes in the eye, the nasal sinuses, the teeth or the ear. The pains and the headache in these conditions are due to stimulation of pain sensitive endings of the cranial or upper cervical nerves.

In many patients headaches are a manifestation of a psychological disturbance.<sup>2, 3</sup> These headaches are due in part to vasodilation and in part to stimulation of the pain endings of the cervical nerves as result of sustained contraction of the cervical muscles.

Headaches are a common sequel of minor or severe head injuries.<sup>4, 5</sup> They are usually present intermittently for several weeks or months after the injury and tend to disappear completely with the passage of time. In some cases the headaches may be localized to the site of the skull or scalp injury. The headache in these cases is due to stimulation of traumatized nerve endings in the contused scalp. In other cases of posttraumatic headache, the pains are localized to the back of the head, or they are diffuse. The mechanism of the production of the head pains in these cases is probably similar to that which is present in patients whose headaches are associated with emotional tension.

The cause of the symptoms in patients

with migraine has not been clearly demonstrated. The various theories<sup>6</sup> as to the causation of migraine include reflex irritation, cerebral edema due to disturbance in the circulation of the blood or cerebrospinal fluid, allergy, duodenal stasis, transitory swelling of the pituitary gland, endogenous or exogenous toxins, endocrine disturbances, and vasomotor disturbances. All of the abnormalities which have been found at necropsy in patients who were subject to migraine headaches during life, are considered to be complications of the disease and without any causal relationship to the symptoms. At the present time the most widely accepted theory as to the pathogenesis of the symptoms<sup>7</sup> is that the prodromal symptoms (scintillating scotomas, hemianopia, paresthesias, and hemiparesis) are due to a functional disturbance in the intracerebral circulation and the headache results from dilatation of the vessels of the head, outside of the brain substance (dural arteries or arteries of the scalp). Support for the hypothesis that the headache is due to dilation of extracerebral cranial vessels is offered by the fact that there is an increase in the amplitude of the pulsation of these arteries,<sup>1</sup> particularly the temporal artery, during the headache, and relief from headaches following injection of ergotamine tartrate is accompanied by a decrease in the amplitude of these pulsations. The findings of an abnormal electrical activity of the occipital cortex in patients with prodromal visual symptoms<sup>8</sup> is supporting evidence for the theory that there is a disturbance in cerebral function which may possibly be due to circulatory changes.

#### DIAGNOSIS

The determination of the cause of chronic or recurrent headaches is often difficult, and requires a careful evaluation of the history, a complete study of the patient, both physical and psychological, and the use of selected laboratory tests—x-rays of the skull, electroencephalogram, examination of the cerebrospinal fluid, cerebral angiography and pneumoencephalography. X-rays of the skull and electroencephalo-

gram, if available, should be a routine part of the study of all patients with headaches. The other examinations should be reserved for those cases in which the history or the physical findings indicate that an intracranial lesion may be responsible for the symptoms.

The location, severity, and other features of the pain are of some value in determining the cause of the headache, but none of the features of the pain is pathognomonic of any cause. It should be remembered that in most cases the recurrent headaches which are associated with diseases of the intra or extracranial structures are characterized by remission of hours' or days' duration. Chronic headaches which are present for twenty-four hours of the day for weeks and months are usually of psychological origin.

The headaches associated with tumors of the brain are usually of a steady aching quality and are moderately severe. They tend to be intermittent but are usually present for some minutes or hours every day. Early in the course of disease the pain may be localized to the side of the tumor in patients with tumors of the cerebral hemispheres or in the back of the head in patients with posterior fossa tumors. With the development of generalized increased intracranial pressure, the headaches are apt to be more diffuse and do not have as much direct relationship to the site of the tumor.

The headaches of fever, migraine, and arterial hypertension are throbbing in character and may occur in any portion of the head. Migraine headaches may be more severe or entirely confined to one side of the head (hemicrania). There is usually a variation in regard to which side of the head is affected in different attacks. If the headaches are localized to the same side of the head in every attack, the possibility of an underlying vascular malformation (hemangioma or aneurysm) should be seriously considered. The severity and duration of migraine headaches are subject to considerable variation. They are usually quite severe and last for a number of hours.



They may recur several times weekly or there may be intervals of many months between attacks. They are apt to be most frequent during periods of emotional stress or when the patient is attempting to cope with difficult life situations. Other characteristic features of the history of patients with migraine include a family history of the disease, onset of symptoms in childhood or early adult life, the occurrence of visual scotomas or other prodromata prior to the onset of the headache, and the development of gastrointestinal symptoms, nausea and vomiting, at the height of the headache.

The headaches associated with emotional tension usually start in the occipital region and spread over the entire head. They are often described as a pressure sensation, arising from within or outside the skull, or as a viselike constriction of the skull in a caplike distribution. Tension headaches may be mild or severe. Occasionally they are intermittent but more often they are constantly present, varying somewhat in the degree of severity during a twenty-four hour period.

#### TREATMENT

The treatment of patients with headaches<sup>2</sup> includes the removal of all causative factors. This may entail operative therapy of remediable lesions, chemotherapy of infectious processes, removal of any allergic factors, or systematic psychotherapy of the cases in which the symptoms are related to emotional stress, personality maladjustments or trying life situations.

The common analgesics are of value in relieving the symptoms in the majority of patients with headaches. Acetylsalicylic acid (0.3 to 0.6 gm.) is effective when the headache is of moderate severity. Codeine sulphate (0.03 grams) may be needed if the pains are unusually severe. Small doses of barbiturates may be added to obtain relaxation and induce sleep.

The above simple measures are often sufficient in patients with headaches of mild or moderate severity, but they are rarely effective in patients with severe headaches of the migraine type, or in patients with headaches associated with psychological

tension. Supportive psychotherapy is necessary in the latter to alleviate their symptoms and in the former to reduce the frequency of the attacks.

In the treatment of the severe attacks of migraine, it is necessary to resort to the use of compounds which contain ergot. The preparations which are most effective are ergotamine tartrate and dihydroergotamine methane sulfonate. These drugs are of greatest value when administered parenterally early in the course of the attack. These compounds act by constricting the dilated extracranial vessels and cannot be expected to be of value several hours after the onset when the vessels become rigid as the result of edema of their walls.<sup>9</sup> One-half milligram of ergotamine tartrate should be given subcutaneously immediately after the onset of the headache or the prodromal symptoms. The drug is more effective when given intravenously in dose of 0.25 milligrams but is more apt to cause vomiting than when given subcutaneously.

Dihydroergotamine methane sulfonate is administered intravenously in dose of 1 milligram. The injection can be repeated in one hour if necessary. This drug is preferable to ergotamine tartrate in patients in whom the use of the latter is regularly accompanied by nausea and vomiting.

Abortion of the attack or relief from the symptoms results in approximately 90 per cent of the cases if either of the above ergotamine preparations are administered parenterally within an hour of the onset of the attacks. They are less effective when given by mouth and much larger doses are required. In addition if nausea and vomiting have developed it will probably not be possible for the patient to retain any drug administered by mouth. When given orally the dose of ergotamine tartrate is 5 milligrams at the onset of symptoms followed by 2 milligrams every half hour until the headache is relieved or until a maximum of 9 to 11 milligrams has been taken.

Preparations which contain a combination of ergotamine and caffeine<sup>10</sup> or atropine (caffergone) are sometimes more effective by the oral route than ergotamine

alone, and require a smaller total of ergot. They can be made in the form of suppositories and given per rectum if emesis prevents oral administration.

The use of ergot preparations is contraindicated in septic and infectious states, in pregnancy, or in patients with coronary sclerosis, Raynaud's disease, or thromboangitis obliterans. Although no case of ergotism has been recorded from the use of these compounds in the treatment of migraine headache, the danger of this complication restricts their frequent use. No definite time limit between treatments can be set, but most authors agree that these drugs should not be administered more than twice in any one week. The less serious toxic effects of ergot preparations in addition to nausea and vomiting include numbness and tingling in the extremities, pains and stiffness in the muscles of the neck and extremities, and a feeling of prostration. These symptoms do not contraindicate further use of the drugs unless they persist for more than twenty-four hours after the treatment.

The ergotamine drugs are of no value in the treatment of patients with psychogenic headaches and are of value in the migraine patients only in aborting or alleviating the symptoms of acute attacks of headache. They do not have any effect on reducing the frequency of the migraine attacks. This can be accomplished only by a long-term psychological treatment of these patients in order to give them an understanding of the basis of their tension, the factors in their life which increase them, and assistance in the resolution of their conflicts and in dealing with difficult life situations.

In the treatment of patients with psychogenic headaches, analgesic and sedative drugs are of some value. The results obtained with their administration, as well as with the use of histamine, special dietary regimes, antiallergic therapy and the like, are directly in proportion to the enthusiasms of the therapist and the amount of encouragement and support which the physician affords the patient. Supportive

psychotherapy similar to that indicated above for migraine patients is needed in all these patients.

#### SUMMARY

Each patient with chronic or recurrent headache is an individual problem in diagnosis and therapy. In a small percentage of the cases a careful study of the patient will indicate that the headaches are due to some definite intra or extracranial pathology. More frequently, no such causes can be demonstrated and the patient is physically normal except for the occurrence of the symptom of headache. The therapy of these cases with headache of unknown cause is twofold: (1) Analgesic drugs for the headaches of psychological origin or the post-traumatic type and ergotamine for the patient with migraine; and (2) psychotherapy in order to relieve emotional tensions and to help the patient cope with difficult life situations. The results which can be obtained depend upon the skill with which the various available medicines are used and psychological guidance is given. The results are often quite gratifying even when only simple supportive psychotherapy is given.

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## THE TREATMENT OF PREECLAMPSIA-ECLAMPSIA\*

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The term "toxemia of pregnancy" is a composite one for preeclampsia, eclampsia, hypertensive disease, and nephritis. The various signs and symptoms of preeclampsia-eclampsia have been divided into the following groups:

Group A	Edema (Weight)		Hypertension (Individual)		Proteinuria
Group B	Cerebral		Visual	Gastrointestinal	Renal
	Headache	Dizziness	Diplopia	Nausea, Vomiting	Oliguria
	Drowsiness	Amnesia	Scotoma	Epigastric Pain	Anuria
	Change in respiratory rate		Blurred Vision	Hematemesis	Hemoglobinuria
	Tachycardia	Fever	Amaurosis	Jaundice	Hematuria
Group C—Convulsions Coma					

We have not been able to prevent preeclampsia but the physician who practices intelligent prenatal care will appreciate the importance of signs of preeclampsia in Group A, and by the proper use of diet, elimination, and suitable drugs, prevent the onset of the symptoms listed in Group B. The development of any or all of the symptoms listed in Group B in a preeclamptic patient indicates that eclampsia is imminent. Termination of the pregnancy is necessary in some patients with toxemia.

Preeclampsia-eclampsia, caused in some unknown way by the pregnancy, is a clinical entity peculiar to pregnancy. A fetus need not be present. In fact, the incidence is greater in patients who have a hydatidiform mole. There is no pathologic lesion characteristic of the disease. The lesions in the liver and kidney are reversible in almost all cases. The hemorrhages in the brain are irreversible and the systolic blood pressure should not be permitted to exceed 200 mm. of mercury, especially in women

whose blood pressure was normal before pregnancy.

Despite the fact that we do not know the cause of preeclampsia and eclampsia, there are frequent reports of changes in treatment which are supposed to give better results. However, those obstetricians who have adhered in general to one type of treatment have had increasingly better results. From 1931 to 1949, 5,161 toxemic

pregnancies were treated in the Chicago Lying-in Hospital. The maternal and fetal mortality has shown a constant decrease. Delivery was induced, between 1931 and 1936, in 21 per cent of patients and another 21 per cent had the pregnancy terminated by either a hysterotomy or a cesarean section. From 1946 to 1949, there were 1,113 patients, as compared with 979 in the first five years, but only 6 per cent were induced and only 10 per cent had a cesarean section or hysterotomy. The total fetal mortality for babies weighing over 1,500 grams in the first period was 7 per cent, and from 1946 to 1949, was 3 per cent. The maternal mortality has shown a marked decrease.

The first evidence of preeclampsia is the too rapid gain in weight, which precedes edema (however, the latter does not always occur). Sooner or later, if the condition is not treated, hypertension and proteinuria develop.

We limit our pregnant patients' weight gain to a maximum of 15 to 17 pounds, an average for the last thirty weeks of pregnancy of  $\frac{1}{2}$  pound per week. A weekly weight gain of  $1\frac{1}{2}$  pounds, or more, is definitely abnormal and should be treated by a reduction in caloric intake and, if this fails, by a limitation of the sodium intake to less than 1 gram per twenty-four hours.

Pitting edema of the legs, hands, face, or

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abdominal wall is abnormal and may be due to toxemia, cardiac disease, anemia, nephritis, or malnutrition. Pitting edema of the ankles, especially in warm weather, is a common finding in most pregnant women. Long before edema is detectable there has been an excessive weight gain.

A systolic blood pressure of 140 or more, or a diastolic of 95 mm. of mercury or more, found on several occasions, is considered evidence of hypertension which may be due to preeclampsia, hypertensive disease, or nephritis. The systolic blood pressure is more labile than the diastolic and usually becomes abnormal earlier than the diastolic. An increase of 30 or more millimeters in the systolic should be regarded as evidence of hypertension.

The usual tests for protein in the urine should be negative in pregnant women. The excretion of 0.02 to 0.2 grams of protein per twenty-four hours is normal for both nonpregnant and pregnant women. An increase in the twenty-four hour excretion, or the presence of protein in a voided specimen, providing there is no contamination from a vaginal discharge, is always abnormal and may be due to preeclampsia, hypertensive disease, or nephritis. There is no specific treatment for proteinuria in pregnancy. The twenty-four hour excretion of 1.0 to 3.0 grams entails careful observation of the patient, and larger amounts indicate an increase in the severity, and usually warrant termination of the pregnancy, both in the interest of the mother and the fetus.

One author states that toxemic patients have been given too much fluid; another one, that they have not been given sufficient amounts. Another one states that mercurial salts are of value in aiding in the elimination of edema; another, that the important treatment is the use of veratrum viride, or plasma, or heparin, and so on. The treatment must be adjusted to the patient and not the patient to a routine treatment. We have adhered in general to the same basic treatment for the past twenty-five years, improving wherever and whenever we found that the change was of value. In general, we rely upon an intake of so-

dium, less than 0.5 gram and approximately 0.5 gram of chloride in the diet. Of late, we have also been restricting the amount of potassium to 1.0 gram. Our studies are too few but we seem to have better results with the low sodium and low potassium diet. The protein intake is maintained at as high a level as feasible (45 gm.) and yet have these amounts of sodium and potassium. The fat is restricted to 66 grams. For some months we have been regulating the water intake of the patient in that she drinks a measured amount of water every hour during the day, sufficient in amount to produce a urinary output of 2,000 ml. per twenty-four hours. If she is in the oliguric phase, we do not force these amounts of fluid by mouth. Ammonium chloride in doses of 8 to 10 grams per day for five days and then miss five days before repeating again, has been of value primarily in the ambulatory case. One does find a more rapid elimination of water but there is a tendency for water forced out by ammonium chloride to reform more rapidly than that eliminated as a result of sodium and potassium restriction.

The best treatment for preeclampsia is starvation, permitting the patient to have all the water she cares to drink. Unfortunately, patients would not accept this regime, and we have found the eclamptic diet to be very satisfactory. It consists of fruits and fruit juices and contains almost no sodium and chlorine as indicated in Table I. It soon becomes almost a starvation diet, since after several days the patients have lost their desire for the diet. It is continued for a period of five to, at the most, ten days.

The low sodium diet is not used for periods longer than three to four weeks and, if it is continued longer than one week, it is supplemented with the various vitamins. The low sodium and potassium is limited to two weeks in the hospital but is used longer with home prepared diets.

*In the patient with preeclampsia all efforts are directed at preventing eclampsia. In the patient with hypertensive disease, eclampsia is uncommon but there is a prob-*



TABLE 1  
DIETS

	FAT	CARB. Gms.	PRO.	CAL.	NA	CL Gms.	K	CA	P	FF (mg)
*Regular	121	237	86	2381	1.4	2.2	4.1	1.6	1.8	12
Low Na.	66	179	65	1570	0.42	0.57	3.3	0.4	1.0	14
Low Na. & K.	52	222	43	1532	0.23	0.38	1.0			
Eclamptic	3	268	9	1135	0.21	0.24	3.8	0.2	0.2	7
Milk Calculated	40	50	33	700	0.51	1.06	1.4	1.2	0.9	2

\*Without 360 ml. milk. Added salt not included.

*ability of fetal death.* This usually occurs after thirty weeks because of placental infarction, retroplacental hematoma, or abruptio placenta.

Our results indicate that the careful medical management of the toxemic patient, if begun early enough, will usually prevent further increase in the severity of the symptoms and signs until the cervix is "ripe". This means that the cervix is effaced, soft and dilatable in the primipara, or soft and partly dilated in the multipara as determined by vaginal examination, and that labor can be successfully induced by rupture of the membranes. If contractions have not begun in six hours, 1 minim doses of pitocin should be given every thirty minutes until the contractions are occurring regularly at three to five minute intervals. The preeclamptic patient usually has an oliguria which minute doses of pituitrin exaggerate. Therefore, pitocin is suggested, but it should be used with caution.

The patient who does not respond to treatment, or has been neglected, is treated by rupture of the membranes and/or the insertion of a bag if the cervical canal is less than 2 cm. long, or, if there is no effacement, by cesarean section under local anesthesia.

The treatment of nonconvulsive toxemia is as follows:

*Edema.* A diet low in sodium, chloride, and potassium. Watch water balance (weight). If symptoms of cardiac decompensation are present, limit fluid intake to 500-1000 ml.

*Hypertension.* Relaxation—Rest in bed. (Ten hours at night and one hour twice a day, or complete bed rest). Sedation for

hypertension of 180 systolic or more: phenobarbital—0.03 to 0.06 gm. three times daily. Elimination: soap suds enema and laxative as needed.

*Proteinuria.* Twenty-four hour determination—1.0 to 3.0 gm. daily is serious. Over 3 gm. daily is ominous.

*Oliguria, anuria, cerebral symptoms.* Eclampsia treatment: (Hypertonic glucose, glucose, sedation, delivery.)

*Pregnancy.* Induction of labor as soon as cervix is "ripe." If signs and symptoms indicate increasing severity, induce labor or perform a cesarean section.

Eclampsia is rare but it still occurs and has a very definite mortality irrespective of treatment. Eclampsia can be divided into mild and severe, and the occurrence of any of the following symptoms or signs warrants a diagnosis of severe eclampsia. In general, patients with severe eclampsia recover only if delivery or fetal death occurs early in the disease.

1. Coma.
2. Temperature of 39° C. or more.
3. Pulse rate over 120.
4. Respiratory rate over 40.
5. More than ten convulsions.
6. Cardiovascular impairment (edema of the lungs, persistent cyanosis, low or falling blood pressure, low pulse pressure, etc.)
7. Failure of our treatment to:
  - a. Stop the convulsions or prevent their recurrence.
  - b. Produce a urinary output of at least 700 ml. per twenty-four hours.
  - c. Produce a dilution of the blood, as indicated by a decrease of at least 10 per

cent in hemoglobin, cell volume, or serum protein concentration.

*Medical treatment of mild eclampsia gives the lowest maternal mortality.* The following outline of treatment has been used by us for many years:

*General.* Constant observation. Retention catheter. Temperature, pulse, respiration, blood pressure and urine every two hours until patient is conscious. Oxygen for cyanosis.

*Convulsions.* At least two of the following drugs are used, preferably the first three: Magnesium sulphate, 50 per cent solution, 12 ml., intramuscularly, and 4 ml. after every convulsion until controlled. Sodium amytal, subcutaneously, 0.25 gm., every eight to twelve hours. Chloral hydrate, 3 gm. in 100 ml. starch water are given by rectum every six to twelve hours, usually after delivery. Morphine sulphate, 0.016 gm., intravenously and repeat until convulsions cease or respirations become twelve per minute. Morphine is least desirable. Intravenous injection of sodium amytal (0.3 - 0.5 gm.) may be necessary to control convulsions. Paraldehyde, 30 to 40 ml. (diluted with oil) by rectum. Elimination: Soap suds enema after sedation. Hypertension: Barbiturates and chloral hydrate. No venesection.

*Renal and cerebral symptoms.* Intravenous injection of 1000 ml. of a 20 per cent glucose solution, two or three times daily, given within thirty to fifty minutes. Sufficient glucose is injected to insure a urinary volume of at least 30 ml. per hour. Occasionally 500 to 800 of a 30 per cent solution is necessary to produce a diuresis. If there is cardiac failure, 100 to 200 ml. of 50 per cent glucose solution are used. Normal saline, Ringer's, bicarbonate solutions, or glucose in saline solution are contraindicated.

*Pulmonary edema.* Regional nerve block. (Whitacre, Hingson and Turner).

*Pregnancy.* If the patient is in labor, delivery is hastened by rupture of the membranes or the use of a bag. If the patient is not in labor, we will, after eight to twelve hours of medical treatment, consider:

1. Induction of labor, if delivery can be completed within eighteen to twenty-four hours, or

2. Cesarean section. This operation would only be performed if the case were of the *severe* type or if cephalopelvic disproportion existed. Local or low spinal anesthesia would be used.

3. Diet. Nothing is given by mouth until the patient is conscious. Then the eclamptic diet, consisting of water, fruits and juices, is given.

There has been much discussion about the use of cesarean section in the treatment of severe preeclampsia and eclampsia. Approximately 40 per cent of eclamptic patients have convulsions before labor, but only one-fourth of these have severe eclampsia. Therefore, the need for cesarean section in the treatment of eclampsia is not very great.

Injections of intravenous glucose in any amount are used only in patients who are oliguric or anuric, in the severe preeclamptic, or the eclamptic patient. The purpose of the intravenous injections of hypertonic glucose is to cause hemodilution, decrease coma, to produce a urinary secretion, and to promote a better circulation throughout the body. We believe, in general, that 1,000 ml. of a 20 per cent solution of dextrose is the optimum amount and concentration and should be given every six to eight hours, in thirty to fifty minutes. The urinary output (30 ml. per hour at a minimum) and the patient's clinical condition are the guides. Occasionally, there is evidence of pulmonary edema and then 500 to 800 ml. of a 30 per cent, or if this also produces symptoms, 100-200 ml. of 50 per cent glucose are used.

We have had some experience with sucrose and sorbitol. If the kidneys are functioning, these solutions can be used, but if the patient is oliguric, then these sugars continue to circulate in the body and produce marked disturbances in the electrolyte equilibrium which are incompatible with life. The same is true of electrolyte solutions such as sodium chloride, sodium lactate, or sodium sulphate. If the salts



cannot be eliminated by the kidney they are retained in the body, and if given in sufficient amount will produce convulsions, coma, hypertension, and anuria.

We have given four units of plasma daily to toxemic patients and have not been able to cause appreciable increases in the serum protein concentration. A hemodilution results and if the injections are continued, pulmonary edema is likely to occur. Salt-poor serum albumin also causes a hemodilution. If given in large enough amounts it will cause an increase in the serum albumin and total serum protein concentration. However, this increase is of short duration because the albumin is rapidly eliminated by the kidneys.

Heparin has been given by intravenous injection, to lower the clotting time of the blood. We have not obtained any evidence that it is of any value. In one patient whose clotting time had returned to normal, a huge hematoma developed in the perineum shortly after a spontaneous delivery without any laceration. It may have been due to the heparin.

No enzymes have been used by us in the treatment of preeclampsia-eclampsia. As we gain more knowledge it is possible that they may have some use. At present, our belief is that they have no place in the treatment of preeclampsia-eclampsia.

We have not been able to lower the incidence of preeclampsia in our clinic by careful prenatal care, by diet instruction or supplement, by vitamins or by any procedure. We have decreased the number of patients with severe preeclampsia and eclampsia. Any patient who gains, on an average, more than  $1\frac{1}{2}$  pounds per week or has edema, is sent to the toxemia clinic. Likewise, any patient who has a blood pressure of 140 systolic or higher, or who has protein in the urine, is sent to the toxemia clinic. She is carefully evaluated, tentatively diagnosed, given written instructions to save a twenty-four hour specimen of urine which she measures, and brings a small bottle in for an Esbach determination. She is instructed to return in a few days, a week or possibly two weeks, depend-

ing upon the appraisal of the case. If she continues to gain too rapidly the dietitian checks her caloric intake. If she shows marked weight gain with proper caloric intake or shows marked edema, she is put on a low sodium and potassium diet usually with ammonium chloride for five days. The diet is not used too long. It becomes extremely tiresome and loses its value. There is little danger of hyponatremia in patients living at home.

We have given many of these patients intravenous injections of large amounts of sodium lactate or sodium chloride and also these same salts by mouth. There seem to be two types of patients, each of whom apparently has preeclampsia. In one, any additional sodium chloride causes a definite increase in edema, blood pressure, and proteinuria. In the other, similar amounts of sodium chloride injections or oral ingestion cause no change. This latter patient is one in whom diet restrictions are of no value and she does not have preeclampsia.

We have learned that preeclamptic and pregnant patients with essential hypertension must be watched carefully by someone who is experienced. There is no need to terminate every pregnancy the minute the diagnosis of toxemia is made. Induction of labor, cesarean section, and other rapid terminations of pregnancy give higher maternal and fetal mortality and morbidity rates than the *obstetrical management*, by which we mean medical treatment and delivery, when it is warranted by the obstetrical findings. The latter necessitates a careful vaginal examination with sterile gloves and rupture of the membranes when the cervix is ripe. If the toxemia is increasing in severity or is already severe, and if the cervix is not ripe, we prefer termination by cesarean section, preferably under local or local and continuous spinal anesthesia. In the last eighteen years, 4,911 patients have been delivered of fetuses weighing over 1,500 grams and only 11 per cent of these patients had a cesarean section. The incidence of cesarean section in mild preeclampsia is 6 per cent, and in

severe, 23 per cent. In hypertensive disease, it is 9 and 26 per cent respectively.

#### SUMMARY

Patients with toxemia must be watched carefully and, if necessary, hospitalized. Delivery should always be by the vaginal route if the obstetric conditions are favorable. Patients with mild toxemia can be treated for a week or weeks until the condition of the cervix warrants induction of labor. Cesarean section entails a mortality of its own and should only be used in pre-eclamptic patients when eclampsia seems imminent and in hypertensive patients when delivery is deemed necessary (between thirty-two and thirty-six weeks) in the interest primarily of the baby.

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## THE EYE IN DISEASES OF THE NERVOUS SYSTEM

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The eye is one of the most important organs in the diagnosis of diseases of the nervous system, as well as an able assistant in diagnosis and prognosis in many general diseases. An ophthalmologist who is on the lookout for signs of disease in his eye examinations will often pick up the first clue. Among the diseases that he may detect are brain tumor, multiple sclerosis, cerebrospinal syphilis, myasthenia gravis, neuro-myelitis optica, and encephalitis. We shall discuss some of these conditions and attempt to show how we may assist the neurologist.

#### BRAIN TUMOR

Brain tumor causes papilloedema, or choked disc, in about 80 per cent of cases. The severest papilloedema occurs from tu-

mors of the cerebellum and of the temporo-parietal region. It is not difficult to detect a choked disc or to measure the amount with a fair degree of accuracy, but by ophthalmoscopy alone it may not be easy to say whether it is optic neuritis or choked disc. The two terms at one time were used more or less interchangeably, but now they are definitely separated, because, while their appearance may be similar, the etiology and pathology are quite different.

There has been much discussion about the cause of papilloedema, and there is still little agreement as to how it is actually brought about. It is, however, undoubtedly a pressure affair producing stasis, and the first sign of it is engorgement of the central vein of the retina and its branches. It seems likely that the obstruction takes place in the intervaginal space where the vein leaves the nerve some 10 millimeters behind the eyeball. It must not be forgotten that conditions other than increased intracranial pressure cause choked disc. Tumors of the orbit that cause pressure on the optic nerve, malignant vascular hypertension, and occlusion of the central vein of the retina in arteriosclerosis, are examples.

The diagnosis between optic neuritis and papilloedema may rest upon two factors—central vision and the state of the visual fields. In true optic neuritis central vision is very rapidly lost due to a central scotoma or blind spot in the field of vision. In choked disc the central vision is well maintained for a long time, and the only change in the field of vision may be enlargement of the normal blind spots. This, however, is not the case if the visual fibers are affected anywhere in their path between retina and visual cortex. It is at this point that the ophthalmologist can be of the greatest help to the neurosurgeon in the careful taking of visual fields. I am fully aware that neurologists and neurosurgeons take fields—one told me once that he could take more reliable fields with his fingers than one of my associates could on a perimeter. That statement left me somewhat cold. All ophthalmologists are taught to take accurate visual fields, and the American Board of



Ophthalmology in its examination devotes a great deal of time to finding whether the candidate understands this phase of his work. If he does not, he gets a chance to study it further.

Pressure on or destruction of fibers of the visual tracts at any point from the ganglion cell layer of the retina to the cortex about the calcarine fissure of the occipital lobe is likely to produce changes in the visual field, and there are certain characteristics of these fields that may be of value in localizing the neoplasm. It may be that since the introduction of encephalography and ventriculography, field studies are less useful than before; yet neurosurgeons usually want all the help they can get before opening a skull to attack a new growth.

Destruction of all the visual fibers in an optic nerve anterior to the optic chiasm produces a blind eye and loss of direct pupillary reaction to light, but the consensual reaction to light thrown in the other eye is retained. Destruction of visual fibers by pressure at the chiasm from pituitary tumors or cysts in that region causes bitemporal hemianopic defects. These begin in the upper temporal quadrant of each field and move slowly toward the center. Eventually the hemianopsia becomes complete but usually spares the macula.

A lesion behind the chiasm causes a contralateral homonymous field defect, and, if it is in the optic tract anterior to the primary optic centers, the scotomata are likely to be incongruous; i. e., if one were placed upon the other, they would not exactly fit. The reason is that it takes some distance back of the chiasm for the separate tracts to collect themselves on their journey to the cortex. Lesions in the lateral geniculate body, which most of the visual fibers use as a relay station, and farther back, are likely to produce field changes that are congruous, i. e., similar, in size and form.

A study of the reaction of the pupils will often give a clue to a disease of the nervous system. Every physician is conversant with the Argyll-Robertson pupil, in which the pupils are miotic and react to accommodation but fail to react to light. I have often

detected neurosyphilis before it had been diagnosed elsewhere by the simple expedient of flashing an ophthalmoscope light into the patient's eye while having him look across the room. Unfortunately we do not know the exact spot in the brain that is diseased when this phenomenon occurs, but we suspect it is near the superior colliculus of the corpora quadrigemina near the third nerve nucleus. We know that the afferent fibers for the pupillary reflex arise in the retina, that part of them decussate just as the visual fibers do, and that they do not go to the external geniculate body along with the visual fibers. We know also that the efferent pupillomotor fibers pass from the third nerve to the ciliary ganglion, thence into the eyeball in the short ciliary nerves and forward into the iris to supply the sphincter. The missing link is where the pupillomotor fibers leave the visual fibers and join the third nerve nucleus.

Formerly we thought the Argyll-Robertson pupil to be pathognomonic of cerebrospinal syphilis, but a closer look has found it occasionally in other diseases, such as encephalitis, syringomyelia, and a few other conditions. I still believe we are 95 per cent right in attributing it to neurosyphilis.

There is a condition known as Adie's syndrome that is sometimes confused with the Argyll-Robertson pupil, although it is not very similar. It usually occurs in healthy young persons, especially women, is most often unilateral, and is not caused by neurosyphilis. In fact the cause is unknown. It is characterized by a moderately dilated pupil that reacts poorly or not at all to light, and by loss of tendon reflexes. The pupil contracts slowly to convergence and is likely then to become smaller than the pupil of the fellow eye.

There are many other conditions that affect the reaction of the pupils, but most of them are due to local disease within the eye.

#### MULTIPLE SCLEROSIS

As we do not see a great deal of this disease in this part of the country I shall not spend much time on it, but there are certain facts about it that should be borne in mind. One is that, being a demyelinating

disease of the nervous system, the signs and symptoms may be very bizarre and hard to detect. The first thing that takes the patient to an ophthalmologist is usually a rather sudden drop in vision in one or both eyes, although occasionally the complaint will be that of double vision. The physician is likely to find lowered vision, a central scotoma, and a normal optic disc. Often the vision will be restored to normal within a few weeks, the scotoma disappears, and it is put down on the record as retrobulbar neuritis, origin unknown. If the lowered vision persists a few months, a slight pallor of the optic disc on the temporal side will be noted. This may be the first episode in multiple sclerosis, and, as it is a slowly developing disease, months or years may pass before enough evidence appears to make the diagnosis conclusive. It is well, however, to bear in mind that it is the presumptive diagnosis in all patients who develop retrobulbar neuritis when other causes are not determined.

#### OCULAR PALSIES

I hesitate to broach this subject in such a short lecture because volumes have been written about it. You all know that there are six pairs of extrinsic, or, as Scobee has called them, "oculo-rotary" muscles, that are responsible for moving the eyes at will in all directions of gaze. There are six cardinal directions, and six muscles in each eye have a main action in that direction. The muscle of one eye has a yoke muscle or associate in the other eye and these work in harmony, acting under the law of reciprocal innervation, so that their opponents relax as the contracting muscles go into action. The same process occurs in the disjunctive movements of the eye, which are divergence and convergence. This works very smoothly, and the person has binocular single vision in all directions of gaze until something happens to the nerve supply of one or more muscles; then, because of the laws of projection and of corresponding retinal points, the patient sees double, and often complains of dizziness. This sounds very simple but is in fact quite complex. Each of the muscles except the lateral and medial recti have two

subsidiary actions aside from their main action. They are either elevators or depressors, but, in addition, are either abductors or adductors, and they are intorters or extorters. The frank paralysis of a single muscle such as the lateral or medial rectus can be diagnosed by any doctor, but when the vertically acting muscles are involved and secondary contractions of opponents and secondary deviation caused by associates come into the picture, only the most astute diagnostician can be sure what he is diagnosing—and he may be mistaken.

The third, fourth, and sixth cranial nerves supply the extrinsic eye muscles and the levator, while the seventh supplies the orbicularis that closes the eye. The sixth, being the longest nerve in its path from nucleus to the lateral rectus, is the most often affected. Next comes the third, and last the fourth. Where the seventh comes into the count I am not sure, but Bell's palsy is fairly common. There is no occasion for going into individual palsies here except to say that they are common in neurosyphilis, myasthenia gravis, encephalitis, localized vascular accidents, and fracture of the base of the skull. Paralysis of conjugate movements is always due to supranuclear lesions.

#### THE PHAKOMATOSES

In 1932 van der Hoeve described a group of tumors that affect the eye as a part of the nervous system and gave them the name phakomatoses, or birth mark, because they are of congenital origin. They all have certain common characteristics, yet are quite different entities. Von Hippel-Lindau's disease, or angiomatosis retinae, forms a tissue in the eye that produces arteriovenous aneurysms, accompanied by angiomatous cysts of the cerebellum. Von Recklinghausen's disease, or neurofibromatosis, often affects the optic nerve or other nerves within the orbit and occasionally produces a tumor in the retina. Bourneville's disease, or tuberous sclerosis, has gray masses within the retina and the brain substance and is often accompanied by adenoma sebaceum. A fourth member was added to the triad later—the Sturge-Weber syndrome. Its features are a cavernous angi-



oma about the eye, glaucoma on the affected side, and sometimes atrophy and calcification of brain substance on the same side.

#### EXOPHTHALMOS

I should like to devote the remaining time to a subject, that although not strictly a disease of the nervous system, has some connection and is, I believe, of considerable importance to every practitioner of medicine. It is not unusual for a patient with exophthalmos to have a goiter removed, and following the operation the exophthalmos, instead of disappearing, gets worse. This is a very disagreeable position for a surgeon to be in, for it may become necessary for someone to perform a decompression of the orbits, such as the Naffziger operation, to save the patient's sight. There has been much speculation as to why this happens in certain cases, and I am sure there is no general agreement yet. However, a Londoner named John H. Mulvany, in 1944, gave what appears to me to be the best explanation yet offered. As it was published in the *American Journal of Ophthalmology*<sup>1</sup> it has not received the attention among general men that its importance justifies. Mulvany divides exophthalmos due to endocrine disturbances into two distinct classes, thyrotoxic and thyrotropic. The first is caused by hypersecretion from the thyroid, the second by excessive hormone from the anterior lobe of the pituitary. There is some correlation between the internal secretion of the thyroid and that of the hypophysis, as there is between most of the endocrine glands. In certain patients, removal of the thyroid seems to stimulate the pituitary to increased secretion, and then exophthalmos increases and may become malignant. Every doctor who has examined the orbits of persons who die of toxic goiter knows that they show very little gross pathology. The muscles are not larger than normal—indeed they are smaller and flabbier, and there is no increase in the orbital fat and no edema. The orbit of the patient with thyrotropic exophthalmos presents an entirely different picture. The extrinsic muscles are huge, edematous, and infil-

trated with round cells, so that the orbital content is greatly increased, and as the only part of the orbit that can give way is anteriorly, where there is no bony wall, the eyeball is pushed forward. The tarso-orbital fascia which extends from the tarsal plate of the lids to the orbital walls is a tough, resistant membrane and reacts to this pressure by producing edema of the conjunctiva and episclera. While it is possible for a patient with thyrotropic exophthalmos to have hyperthyroidism, it is not at all necessary, and there are usually signs that betray the thyrotropic origin of the exophthalmos if carefully sought for. The explanation offered for exophthalmos in thyrotoxicosis is that the asthenic extrinsic ocular muscles cannot withstand the pull of the smooth muscle collar known as Landström's muscle, which attaches in front to the orbital septum and behind to the fascial extension of the recti muscles just anterior to the equator. Müller's palpebral muscles, especially the upper, act to retract the lids, thereby increasing the width of the palpebral fissure. Both Landström's and Müller's muscles are supplied by the sympathetic nervous system and sympatheticonia is always a part of hyperthyroidism.

In order to differentiate between these two types of exophthalmos and avoid doing an unnecessary and perhaps unwise operation, Mulvany stressed the following points, and my limited experience has led me to accept them as true. Thyrotoxicosis is essentially a disease of young adults, and is three times as common in women. There are other signs of toxemia, such as rapid pulse, loss of weight and strength; and the basal metabolic rate is increased. Locally there is no edema of the lids or conjunctiva and there is no resistance as the eyeballs are pushed back into the orbit.

In thyrotropic exophthalmos these local signs are all present due to the overdistended orbital contents, and the general signs of toxic goiter are not found unless the two conditions occur simultaneously. Thyro-

tropic exophthalmos is more common in men around 50 years of age.

One type of exophthalmos I should like to mention is frequently overlooked. Recently I saw a young woman who, following cesarean section, had a sudden protrusion of one eye. She had been to three doctors and none recognized it because they failed to put a stethoscope about the eye and hear the loud bruit of an arteriovenous aneurysm. Of course this is a very unusual complication of childbirth, but it can occur. About 77 per cent of this kind of exophthalmos are traumatic in origin, and the rest are spontaneous. The latter usually occurs in old arteriosclerotics. Usually it is caused by a communication between the cavernous sinus and the internal carotid artery, but aneurysm of the ophthalmic or internal carotid artery will produce it. The third and sixth nerves are often affected, especially in fractures of the base of the skull. Ligation of the internal carotid artery is usually necessary to stop the disagreeable symptoms.

Formerly the mortality in thrombosis of the cavernous sinus was 100 per cent. This infection usually enters the blood stream from a lesion of the upper lip, nares, or side of the face, or by way of the sinuses. I have recently seen a woman who escaped such a catastrophe with loss of the sight in one eye. The infection started in the nares and she had severe proptosis when admitted to the hospital. Large doses of penicillin, streptomycin, and sulfonamides stopped the infection, although there was some chemosis of the second eye at one time. This is the only person with thrombosis of the cavernous sinus I ever knew to recover, and I mention this so that, if you encounter the condition and treat it heroically, you may be able to save a life that would until recently have been lost.

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## HEART DISEASE IN THE SHREVEPORT CHARITY HOSPITAL

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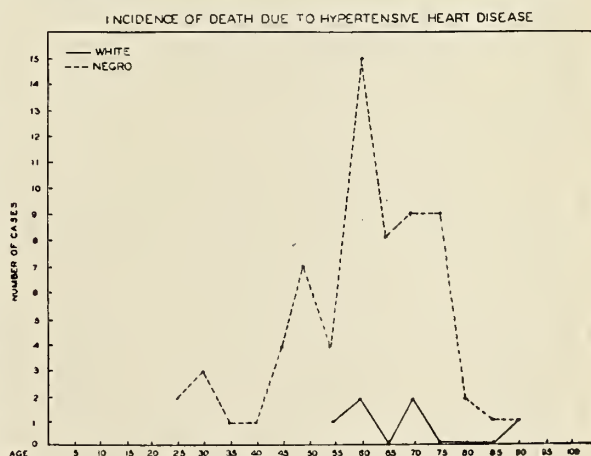
#### SHREVEPORT

Several years ago, a statistical analysis of 1,045 autopsies of deaths due to heart disease in the Charity Hospital of Louisiana at New Orleans was made by two of us.<sup>1-4</sup> This included the period 1935-1940. The criteria of classification of the etiological causes of heart disease as set forth by the American Heart Association were used.

This present survey includes all of the autopsies on cardiac deaths in another large Charity Hospital in Louisiana, the Shreveport Charity Hospital. The years 1944-1948 were included in this survey. (Table 1) All of the autopsies were done by or under the close supervision of Dr. W. R. Matthews. Table 2 shows the number of deaths and autopsies and the total number classified as cardiac deaths.

#### HYPERTENSIVE HEART DISEASE

There were 73 deaths due to hypertensive heart disease in this survey comprising 30.6 per cent of the total group. Only 6 of these were of the white race, and 2 of these were females. One of these also had rheumatic heart disease. Of the remainder, 67 negro patients, 45 were males. (Fig. 1).



The peak started to rise at 40 and reached its maximum at 55 years of age. The white patients died at a later age.



TABLE 1  
CARDIAC DEATHS AT  
SHREVEPORT CHARITY HOSPITAL  
1944-1948 INCLUSIVE

ETIOLOGY	WHITE RACE				NEGRO RACE				GRAND PER CENT	
	M	F	Total	%	M	F	Total	%	Total	Total
Hypertensive heart disease	4	2	6	8.2	45	22	67	91.8	73	30.6
Syphilitic cardiovascular disease	2	0	2	6.9	22	6	27	93.1	29	12.3
Bacterial infection	3	2	5	18.5	12	10	22	81.5	27	11.3
Arteriosclerotic heart disease	15	0	15	57.7	6	5	11	42.3	26	10.9
Congenital heart disease	1	2	3	17.8	10	3	14	82.2	17	7.1
Toxic heart disease	0	0	0	0.0	6	10	16	100.0	16	6.7
Dissecting aneurysm	0	0	0	0.0	11	1	12	100.0	12	5.0
Rheumatic heart disease	1	0	1	10.0	2	7	9	90.0	10	4.1
Pulmonary disease	3	1	4	50.0	2	2	4	50.0	8	3.4
Anemia	0	0	0	0.0	3	3	6	100.0	6	2.5
Tumor	0	0	0	0.0	3	1	4	100.0	4	1.7
Avitaminosis	1	0	1	50.0	0	1	1	50.0	2	0.8
Trauma	0	0	0	0.0	2	0	2	100.0	2	0.8
Unknown	1	0	1	10.0	0	0	0	0.0	1	0.4
Combined	0	0	0	0.0	1	0	1	100.0	1	0.4
Other	0	0	0	0.0	0	4	4	100.0	4	1.7
TOTAL	31	7	38	16.0	123	75	200	84.0	238	100.0

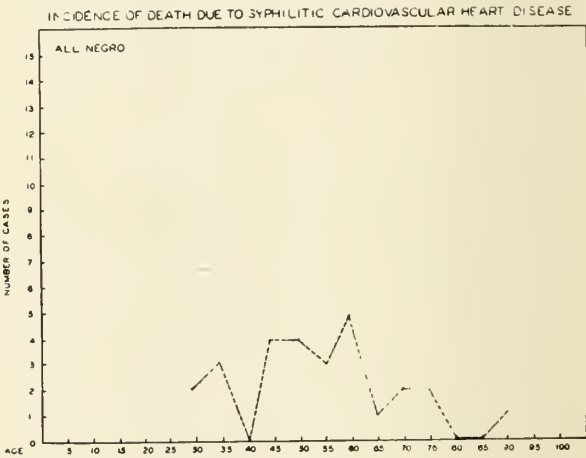
TABLE 2  
ADMISSIONS, DEATHS AND AUTOPSIES  
SHREVEPORT CHARITY HOSPITAL  
1944-1948 INCLUSIVE

WHITE	NEGRO				M	F	Total	%	Gr. Total
	M	F	Total	%					
Admission	10,136	10,930	21,066	28.0	20,496	31,079	51,575	72.0	72,641
Deaths	501	241	742	23.4	1,250	1,062	2,312	76.6	3,054
Autopsies	149	76	225	15.8	661	535	1,196	84.2	1,421
Cardiac deaths	31	17	38	16.0	125	75	200	84.0	238

The complicating cardiac conditions in the Negro group were: arteriosclerosis 12, periarteritis nodosa, Kimmelstead Wilson disease, syphilitic heart disease, congenital heart disease and rheumatic heart disease one each.

SYPHILITIC HEART DISEASE

The second most common etiological cause of cardiac deaths was syphilitic heart disease. There were 29 such deaths, and all but 2 were Negro. (Fig. 2). Of the total number, 13, or 45 per cent, had luetic involvement of the heart per se, including luetic aortic valvulitis in 10, acute luetic myocarditis in 1, and luetic occlusion of coronary ostia in 2. The remaining 16 had aneurysms. These were divided into 16 Negro males, 3 Negro females and 2



white males, age 66 and 70. The aneurysms were located as follows: ascending arch, 4, transverse arch, 4, descending arch, 4, abdominal aorta, 2, innominate artery, 1, and ruptured aneurysm rt. coronary, 1.

## BACTERIAL HEART DISEASE

Bacterial heart disease was the third most frequent cause of cardiac death in this series. There were 27 deaths, or 11.2 per cent, of the total number. There were 5 white, of which 2 were female, and of the remaining 22 Negro deaths, 12 were Negro males. All of the white deaths were due to subacute bacterial endocarditis. Three of the Negroes had chronic bacterial endocarditis, the remainder had acute. The ages at death varied from 15 to 65 years. Rheumatic heart disease was found in 14 of the total number of cases. One colored female, 5 months of age, had acute suppurative pancarditis with abscess of the heart. The following organisms were recovered on blood culture; streptococcus viridans 6, staphylococcus 6, pneumococcus 3, meningococcus 2, brucella abortus 1, and undetermined 9.

## ARTERIOSCLEROTIC HEART DISEASE

There were 26 deaths, or 10.8 per cent, of the total number which were considered as due to arteriosclerosis. There were 15 white males and no females. Eight of these had acute infarction, 4 posterior and 4 anterior. Severe coronary sclerosis without infarct was found in 4 and calcific arteriosclerosis was present in 3. Of the remaining 11 Negro deaths, there were 6 males and 5 females. There were 5 infarctions, 2 of the interventricular septum, 2 anterior and 1 posterior. There were 2 deaths due to severe sclerosis without infarction and 4 due to aortic calcific disease. (Figure 3).

INCIDENCE OF DEATH DUE TO ARTERIOSCLEROTIC HEART DISEASE



## CONGENITAL HEART DISEASE

There were 17 cardiac deaths due to congenital anomalies, 7 females and 10 males. There was 1 white female and 2 white males. The ages at death varied from 3 days to 58 years. The details of these cases are to be saved for a later paper and will not be discussed here.

## TOXIC HEART DISEASE

Sixteen deaths, all colored, were attributed to toxic heart disease. There were 10 females and 6 males. Fiedler's interstitial myocarditis accounted for 10 deaths, typhoid fever 1, burns 1, general sepsis 1, and postpartal heart disease 3.

## DISSECTING ANEURYSMS

Twelve deaths, all Negro, were due to dissecting aneurysms, and all but 1 were males. All had evidence of hypertension. Ten died from rupture into the pericardial sac, and 2 from initial shock.

## RHEUMATIC HEART DISEASE

The eighth most common cause of cardiac deaths in this series was rheumatic heart disease. There were 10 deaths, and all but one were colored. The ages were as follows: 7, 8, 8, 23, 23, 29, 38, 39, 48 and 60.

## PULMONARY DISEASE

There were 9 deaths attributed to pulmonary disease, 4 of which were white and 4 Negro. Of the white deaths, 1 a white male, age 70, had chronic cor pulmonale from emphysema and 2 white males, 50 and 59 respectively, and 1 white female, age 62, had chronic cor pulmonale from carcinoma of the lung. One Negro female, age 16, had Ayerza's disease; 1 Negro female, age 44 had cor pulmonale from chronic pulmonary tuberculosis, and 1 Negro male had cor pulmonale from metastasis to the lung of a carcinoma of the pancreas.

## ANEMIC HEART DISEASE

There were 6 deaths, all Negroes, and of which 4 were females, whose deaths were considered due to chronic anemia. A female, age 18, and a male, age 4, had sickle cell anemia, and 2 males, ages 47 and 52, respectively, had pernicious anemia. A female, age 30, had chronic uterine hemorrhage and a female, age 64, had myeloid leukemia.



## TUMORS OF THE HEART

There were 4 Negro deaths from tumors of the heart. A male, age 70, had metastatic nodules to the heart and pericardium with primary source undetermined. A female, age 38, had a metastatic carcinoma of the heart with cardiac tamponade. A male, age 57, had a rhabdomyosarcoma of the diaphragm with metastases to the heart. A male, age 43, had a primary rhabdomyosarcoma of the right auricle and ventricle involving the tricuspid valve.

## OTHER

There were 2 Negro females, ages 63 and 14, with acute disseminated lupus with adhesive pericarditis; 1 Negro female, age 51, with Concato's disease; and 1 Negro female, age 6, with acute dilatation of the heart from a too rapidly given transfusion.

## AVITAMINOSIS

There were 2 deaths from beri-beri; a white male, 9 months, and a Negro female, age 27 months.

## TRAUMA

Two negro males, age 23 and 17 respectively, died from a stab wound of the apex of the left ventricle.

## UNKNOWN

One white male, age 85, with hypertensive heart disease, died while intravenous aminophyllin was being administered.

## COMBINED

One Negro male, age 87, had arteriosclerotic heart disease, a dissecting aneurysm, starting 9 cm. beyond the aortic valve and re-entering the aorta at the origin of the left subclavian. He also had a coarctation of the aorta with a small saccular aneurysm proximal to it. The coarctation was to the left of the origin of the subclavian artery. There was marked arteriosclerosis of the aorta.

## SUMMARY

A statistical survey of 238 autopsied cardiac deaths that occurred at the Shreveport Charity Hospital between the years 1944-1948, inclusive, has been presented and analyzed according to age, race, sex and etiology.

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## PERFORATION OF OVARIAN CYSTIC TERATOMA INTO RECTOSIGMOID

(COMPLICATING PUERPERIUM)

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AND

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SHREVEPORT

The occurrence of cystic teratomata (dermoid cysts) of the ovary is quite frequent, the incidence usually being stated as about 10 per cent of all ovarian neoplasms. However, rupture and perforation are quite infrequent. Three cases in which rupture was a result of trauma have been reported by James<sup>1</sup> and Piper.<sup>2</sup> Several cases of perforation with discharge of the cystic contents into various organs have been reported. Bonney<sup>3</sup> indicated that rupture into the vagina is more frequent than rupture into other pelvic organs, though it occurs infrequently.

Rectal and presacral dermoids protruding into the rectum and vagina have been reported.<sup>4-8</sup> The case reported here is the ninth in which an ovarian dermoid communicated with the intestines. In a previously recorded case,<sup>9</sup> hair extruded into the rectosigmoid, while in another<sup>10</sup> the intact wall of the dermoid eroded into the rectum. Both rectosigmoid and small intestine were perforated in another case.<sup>11</sup> Murdock<sup>12</sup> reported a case in which a papillomatous mass from the inner cyst wall of a dermoid spontaneously perforated the rectum. Similar cases were reported by Michaelis<sup>13</sup> and Bonney in which an ovarian dermoid was forced through the intestinal wall at the cul-de-sac and passed through the rectum during labor. Love<sup>14</sup> described a case in which a dermoid communicating with the vagina and rectosigmoid presented an ex-

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posed molar tooth on an alveolar-like ridge. Haggard<sup>15</sup> in 1907 reported that a right-sided dermoid had ulcerated into the cecum and bladder, while in 1909 Derveaux<sup>16</sup> described a case in which a dermoid involved the rectum and bladder.

In a clinical review of 225 cases of ovarian dermoid, Blackwell<sup>17</sup> noted that pain was the most common complaint which brought the patient to seek medical advice. This pain varied from a dull ache to the sharp pain produced by torsion of the pedicle. The pain was referred to the side from which the tumor arose in all but 2 cases. Of the 15 per cent of cases in which preoperative complications occurred, twisted pedicles were present in 17 cases and rupture had occurred in 1. In only 1 case was the cyst acutely infected, although it is generally agreed that these cysts are especially liable to such a complication. In reviewing 415 cases of ovarian dermoids, Marshall<sup>18</sup> found approximately the same proportion of symptoms and complications.

#### CASE REPORT

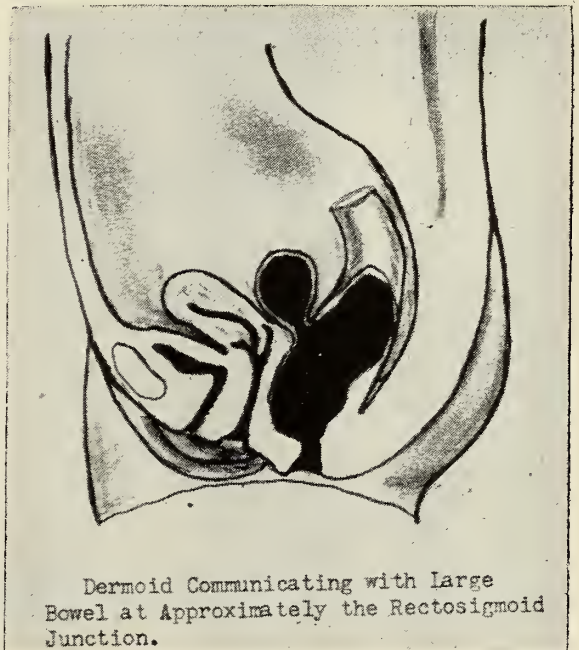
Mrs. B. O., a 30 year old gravida III, para III, white female was first seen here on December 26, 1949 with the chief complaint of lower abdominal pain and hair passing from the rectum. The patient was delivered of her third child August 20, 1949. The pregnancy, delivery, and puerperium were uneventful until three weeks post partum. At this time, her temperature ranged between 104° to 105° F. daily. This fever lasted for two weeks and was associated with rather severe intermittent attacks of cramplike and sharp lower abdominal pain. She consulted a local physician who gave her one of the sulfa drugs which effected no improvement. When she was one month post partum, she consulted a second doctor who treated her with penicillin and aureomycin. At the end of eight days of this treatment, the patient's temperature returned to normal while the lower abdominal pain improved somewhat but was still present. Following this therapy, the temperature remained normal but soreness continued in both lower quadrants of the abdomen. The pain was sharp at times and at other times cramplike in nature. On December 8, 1949, a large amount of hair was passed by rectum. This recurred on two occasions at weekly intervals, the last being December 22, 1949. The hair was rather abundant in amount. The stools had been formed and normal in amount with the exception of the week prior to admission, at which time the passage of a greenish liquid was noted. During the illness,

there was an associated weakness, anorexia, and weight loss of 10 pounds.

The past medical history and review of systems were noncontributory. The admission temperature and blood pressure were normal. A small nontender mass was noted in the lower left quadrant. Pelvic examination showed the hair distribution to be female in type; Bartholin's and Skene's glands negative; perineum was fairly well supported while the anterior and posterior vaginal walls showed moderate relaxation. The cervix presented mild chronic cervicitis with a patent os. The fundus was forward in position and seemed to be of normal size but was firmly fixed. Rectovaginal examination revealed considerable induration in the cul-de-sac which extended into the left adnexal region; a mass about 6 by 8 cm. in diameter was palpable posterior and slightly to the left of the fundus. A constriction in the rectum was noted at the tip of the examining finger. The impression at the time was dermoid cyst of the left ovary with penetration and rupture into the large bowel.

A flat plate of the abdomen showed nothing of significance.

Proctoscopic examination revealed a large



amount of creamy pus having a very foul (*E. coli*) odor. When this was aspirated, a markedly injected edematous mucosa was seen which was freely movable over an underlying mass. No distinct ulceration or fistulous opening was identified, but several clumps of hair were removed from the edematous mucosa anteriorly.

The patient was prepared for surgery with sulfathaladine and a low residue diet. When exploration was carried out, an ovarian dermoid was seen in the cul-de-sac, measuring about 7 by 6 by 5 cm.



in diameter. It was quite loosely adhered to the anterior wall of the large bowel at about the level of the rectosigmoid junction. The cyst was easily separated from the bowel and removed. The communication into the bowel was then closed with no difficulty.

Microscopic examination revealed an infected, complex, though perfectly benign dermoid cyst. In addition to epidermis and skin appendages, brain endyma and an abortive choroid plexus were noted. The lining in many areas was replaced by granulation tissue.

Examination six week postoperatively showed the uterus to be in the midline and anterior in position. A marked decrease in the pelvic induration was noted. Digital examination of the rectum revealed a slight amount of induration anteriorly at the tip of the examining finger.

#### SUMMARY

An unusual case report is presented in which an ovarian dermoid complicated the puerperium by perforating the large bowel at the level of the rectosigmoid. The perforation occurred three weeks post partum and was characterized by lower abdominal pain, spiking fever and the passage of hair by rectum. Removal of this was accomplished easily and the convalescence was uneventful.

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## DIGITOXIN OR DIGITALIS LEAF: WITH SPECIAL REFERENCE TO THE TOXICITY OF DIGITOXIN\*

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NEW ORLEANS

In recent years the increasing use of the purified glycosides of digitalis has threatened the status of the time honored leaf preparations. Much controversy has arisen in the literature leaving many clinicians in doubt as to the choice, optimal dosage, and method of administration of a suitable member of the digitalis group. This paper will attempt to arbitrate and consolidate some of the existing opinions, in order to simplify for the busy practitioner selection and use of a suitable drug. The author's experience with digitoxin in 78 cases is added to the existing literature.

#### SOURCE, CHEMICAL STRUCTURE, PHARMACOLOGY

Official digitalis is the dried leaf of the foxglove plant *Digitalis purpurea*. Both the leaf and the seed contain the active principle, but the drug is obtained from the leaf only.<sup>17</sup> The active principles of digitalis are the glycosides which occur in combination with saponins, rennins and tannins. These are therapeutically inert and are thought to affect the solubility of the glycosides which are formed by a combination of sugar with aglucone. The aglucone is responsible for the pharmacologic activity of the glycoside, and when combined with the sugars the potency and toxicity of the active principle is increased. The sugars may also be responsible for water solu-

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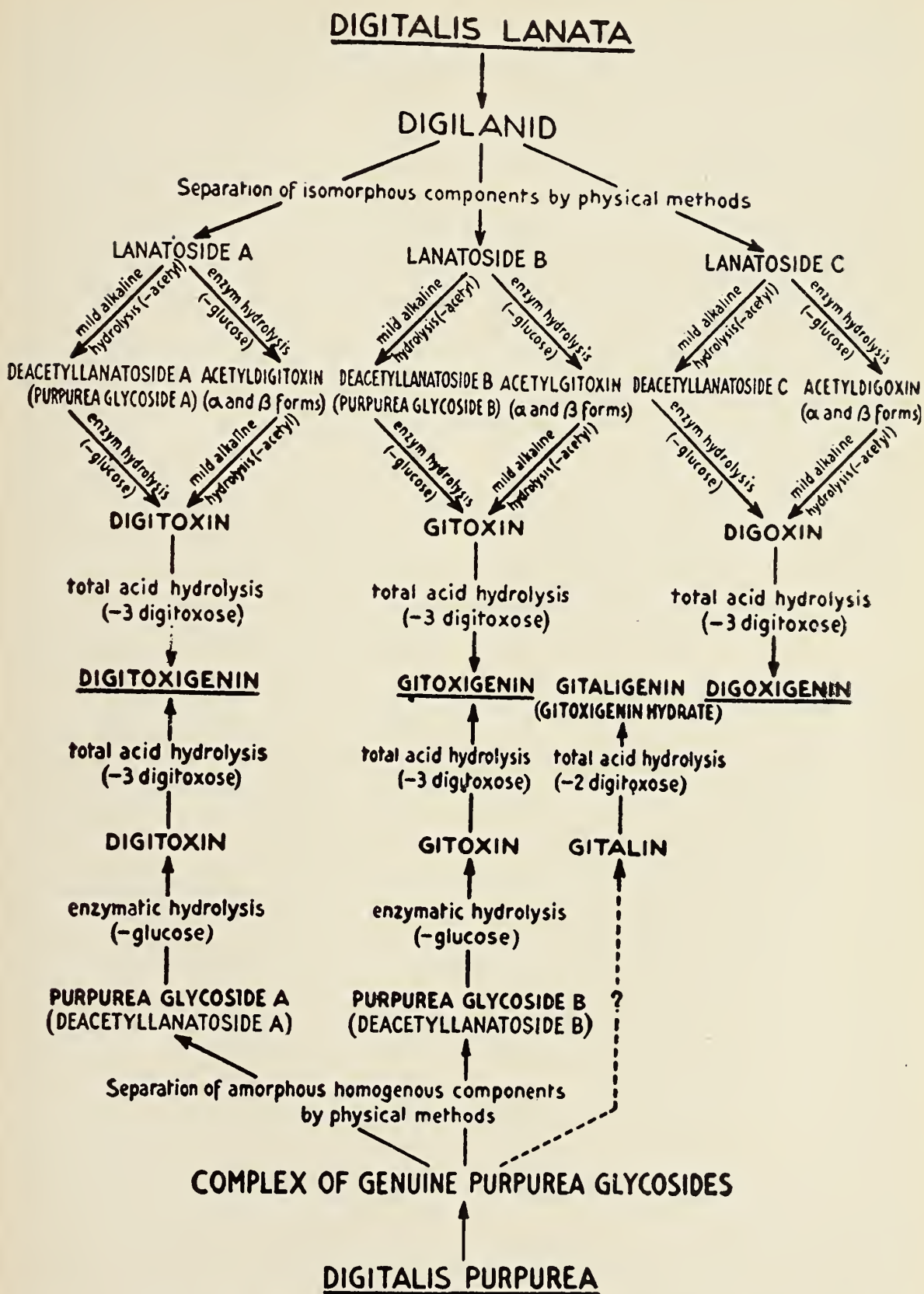


CHART 1. The newly discovered relationships between the lanata and purpurea glycosides (after Stoll and Kreis).



bility and cell permeability, as well as persistence of cardiac action.

Stoll<sup>20</sup> was one of the pioneers in the isolation of the pure glycosides of digitalis. A diagram taken from his monograph will reveal the derivation of the various fractions of the digitalis bodies. (Fig. 1). The aglucones can be liberated from their linkage with the sugars by enzymatic or acid hydrolysis. Chemically they are related to the sterols and bile acids. *Digitalis purpurea* yields the glycosides gitalin, gitoxin and digitoxin. The latter two are derived from the natural glycosides, deacetylannatosides A and B. The aglucones derived are different while the sugars are the same. The one of importance is the aglucone of digitoxin known as digitoxigenin.

It is important for the physician to know the digitalis preparation he is using, since the clinical effect of digitalis standardized according to U.S.P. XIII may differ from that found in previous pharmacopeias. Some of these variations may result from variability in site of growth of the plant, as well as age of the plant. The biological technic continues to be employed as a means of determining the potency of the leaf preparations. There are many variables in the technic of cat assay which measures lethal potency and not therapeutic effect. Human methods of assay may eventually replace the older, less accurate measurements. However human reactions to the drug vary widely and in the same individual from time to time, regardless of its actual potency. Therefore, digitalization of each patient should be carefully individualized.

Whole leaf digitalis is available in many different forms. Powdered digitalis can be administered in pill, capsule, tablet, or even suppository form. It suffers little loss of potency over a period of years. Tincture of digitalis which does undergo some deterioration is not recommended for general use since there is likely to be confusion between minims and drops. There are preparations available for parenteral use such as digifoline, digiglusin, digalen, and others, containing 1.5 grains to either a 1 or 2 cc. ampoule. Any of these products may pro-

duce some pain at the site of injection or thrombosis of a vein if given intravenously. Expected potency varies and deterioration has been demonstrated even in the glass ampoules.

Credit for the isolation of the purified glycoside digitoxin should probably go to Nativelle,<sup>18</sup> who in 1867 isolated from *Digitalis purpurea* a cardioactive principle, given the name digitaline cristallise. In 1875 Schmiedeberg<sup>19</sup> reported the isolation of a closely allied drug which he named digitoxin. Opinions vary as to whether these two substances are identical but at the present time it is felt that the two can be used interchangeably. The preparations purodigin, cristodigin, digisidin, and unidigin are all digitoxin sold under various trade names. They are available in tablet form containing 0.1 and 0.2 mg. of the drug, and 1 cc. and 2 cc. ampoules containing 0.2 and 0.4 mg. respectively.

Oral digitoxin is the only glycoside not characterized by delayed onset of action and a greater requirement of effective substance as compared with parenteral administration. The potency of 1 mg. of digitoxin is approximately equal to 1000 mg. of U.S.P. XIII digitalis reference powder. After oral digitoxin, a decline in ventricular rate results which is complete in four to ten hours. Initial effect may be noted as soon as twenty-five minutes after intravenous injection with maximal effect in two to nine hours. McMichael<sup>16</sup> by means of cardiac catheterization has demonstrated that the initial action of digitalis is to lower the venous pressure in a manner not clearly known. This assistance to the failing heart can certainly be rendered in a better fashion by a purified glycoside such as digitoxin than by a compound substance poorly absorbed like digitalis leaf. The effect of digitoxin begins to regress in two or three days, the total duration of effect lasting two weeks. The cumulative action of digitoxin is similar to that of whole leaf. Due to relative freedom from local irritation of the former, the signs and symptoms of cumulation are more insidious. The excretion of any digitalis drug is a

function of the amount available within the body rather than the amount administered. Gold *et al*<sup>7-10</sup> found no significant difference between the toxic and therapeutic dose for digitoxin as compared to digitalis leaf.

#### ANALYSIS OF 78 CASES

The author's series includes 78 cases personally treated with digitoxin for varying periods of time from January 1946, through February 1949. Many additional cases given this glycoside were discarded due to inadequate follow-up. These patients, both hospital and ambulatory, included 34 with arteriosclerotic heart disease, 10 with coronary thrombosis due to arteriosclerosis, 22 with hypertensive cardiovascular disease, 9 with rheumatic heart disease, and 3 cases of luetic aortic valve disease. They ranged in age from 30 to 77 years, and none had received previous digitalis. There were 64 patients digitalized by the multiple dose technic in a period of twenty-four to thirty-six hours. This consisted of an initial dose of 0.4 to 0.6 mg. followed by 0.2 to 0.4 mg. every four hours until the ventricular rate was between 70-80 per minute. In 14 instances 1.2 mg. of digitoxin was given as a single digitalizing dose either orally or intravenously. No immediate toxic action was observed. The total amount necessary to achieve full digitalization varied between 1.4-1.8 mg. with the majority of the cases requiring 1.6 mg. No particular difficulty was encountered in the ambulatory cases who were followed closely until an optimum effect was reached. Maintenance dose consisted of 0.2 mg. daily, with the exception of 5 cases where nausea after one to three weeks necessitated reduction of the dose to 0.1 mg. daily. One case of luetic heart disease required 0.3 mg. as a maintenance dose. All patients were placed on a low sodium diet with salt substitute and questioned at intervals as to their faithfulness to the diet. No quantitative follow-up of urinary chloride was done.

Clinical and electrocardiographic evidence of digitoxin intoxication included 6 instances of nausea, 1 of diarrhea, 1 case with pulsus bigeminus, 1 case of 2:1 AV

block, 1 case with IV block and 2 cases in which the P.R. interval was prolonged. In some of these cases it was felt that the arrhythmias might have been due to the disease process. Many abnormal electrocardiograms were noted prior to digitalis therapy and several of these patients took digitoxin without ill effect in spite of heart block. One patient with severe cardiac insufficiency showed A-V dissociation and IV block in his electrocardiogram, yet he has taken a daily maintenance dose of 0.2 mg. digitoxin without toxic effect for more than a year. Another patient with rheumatic heart disease and a fixed bigeminy takes digitoxin with no clinical evidence of toxicity. Follow-up of ambulatory patients was daily until fully digitalized, then two or three times a week for the next two weeks, and finally longer periods of time were employed. Patients were instructed to report any of the usual symptoms or signs of digitalis intoxication. Table I illustrates graphically the analysis of the author's cases.

#### CLINICAL USE

Gold<sup>8-11</sup> states that there are four major criteria for the selection of an oral preparation of digitalis: (1) High potency—the more potent the less drug to irritate the intestinal tract; (2) uniform potency; (3) must be rapidly and completely absorbed from the gastrointestinal tract; (4) fairly persistent action. Digitoxin fulfills all of these criteria, but as previously mentioned the leaf preparations do not. Gold reports more than 1,000 cases given 1.2 mg., intravenously, as an initial digitalizing dose and emphasizes that this is an average dose. Follow-up doses of 0.2 to 0.4 mg. are recommended to the point of full digitalization. He then used maintenance doses of 0.1 to 0.2 mg. daily. A scatter curve revealed that 75 per cent of fibrillators maintained a ventricular rate of 60 to 90 beats per minute with 0.2 mg. daily. Only 2.8 per cent of this entire series showed minor toxic reactions with a 1.2 per cent incidence of nausea.

DeGrafe *et al*<sup>3</sup> in a recent article attempt to evaluate digitoxin for the initial digi-



TABLE 1  
ANALYSIS OF 78 CASES

ETIOLOGY	NO. CASES	TIME ON DIGITOX	MULTIPLE DOSE IN 24-36 HRS.	AVERAGE AMOUNT REQUIRED	SING. DOSE 1.2 MG.	MAINTENANCE DOSE			EKG BEFORE DIGITOX	TOXICITY	
						mg	mg	mg		Clinical	EKG
						0.1	0.1	0.3			
Arterio- Sclerotic	34	Average 21 mo.	28	1.6mg	6	3	31	0	3-I-V block 1-A-V block 4-Fibrill.	2-nausea 1-diarrhea	bigeminy 1 case
Arterio- Sclerotic Coronary Thrombosis	10	22 mo.	10	1.4mg	0	0	10	0	1-AV-IV Bl. 2-IV Block	1-nausea	1 case 2:1 AV block
Arterio- Sclerotic with Hypertension	22	25 mo.	17	1.6mg	5	2	20	0	1-IV Block 1 Fibrill. 1 P.A.Tachy.	2-nausea	2-prolong P-R
Rheumatic	9	18 mo.	7	1.6mg	2	0	9	0	1-Bigeminy	1-nausea	1-IV Block
Luetic Aortic	3	15 mo.	2	1.8mg	1	0	2	1	.....	.....	.....

talization of patients with cardiac failure. Their results are at variance with the work of Gold, Katz and Wise<sup>12</sup> and others. Higher average therapeutic doses were found necessary by the multiple dose method, the average being 2.2 mg. as compared with 1.7 mg. for the single undivided daily dose, and 2.7 mg. for the single large dose with supplementary administration of digitoxin. The doses seem high in this series of 67 patients and it should be remembered that considerably more of a digitalis preparation can be given beyond the optimum dose with the same therapeutic effect.

Stewart and Newman<sup>21</sup> determined the amount of digitoxin necessary for adequate digitalization in 26 patients. They concluded that in most patients 1.2 mg. was inadequate for full digitalization either orally or intravenously. The average amount required in twenty-four hours was 2.0 mg. and they found that the average maintenance amount is between 0.1 to 0.2 mg. It was felt that it was more difficult to keep patients in equilibrium with digitoxin than with the whole leaf.

Levy<sup>4</sup> supports some of Gold's principles with added words of caution. He advises

the multiple dose method when previous digitalis is uncertain, the total dose required depending on direct clinical observation. Since many patients give an incorrect history of drug therapy this would seem the method of choice. Ward cases in severe failure may require somewhat higher doses than ambulant fibrillators or cases of mild failure. The body weight and general condition of the patient should likewise be considered, as well as the precipitating cause of the failure. The type of heart disease may influence the dosage since aortic regurgitation may require more than simple failure on an arteriosclerotic basis. All patients should be observed at frequent intervals until stabilized and the intelligence of the patient may influence the number of return visits needed. Friedberg and Zoll<sup>6</sup> reported the necessity for redigitalizing some patients after an interval of four to six months. In the author's series of cases no such necessity arose. The presence of infection, failure to follow a low sodium regime, and the too infrequent use of mercurials, may account for such cases. Sudden change of activity from a very sedentary to a more ambulatory routine should

also be considered. (Table II illustrates the factors important in digitoxin dosage.)

TABLE II  
IMPORTANT FACTORS IN DIGITOXIN DOSAGE

1. Degree of heart failure: ward cases usually require more than ambulatory patients.
2. Previous digitalization: when in doubt divided doses indicated.
3. Weight and general condition of patient.
4. Type of heart disease: theoretical maximum improvement?
5. Precipitating cause of heart failure.
6. Predominant rhythm: watch fibrillators who become ambulatory.
7. Type of patient: private or clinic case. Observe at frequent intervals until stabilized.

The many advocates of digitalis leaf feel that there are few if any indications for intravenous digitalis therapy. It is true that for many years in emergency situations intramuscular leaf preparations were given to replace oral therapy. Absorption of an impure drug is inconstant and local irritation frequently resulted, due to the fact that each cat unit was contained in 1 or 2 cubic centimeters of fluid. The use of a pure glycoside, such as digitoxin seems clearly indicated by the intravenous route under the following conditions: (1) In the presence of acute dilatation of the heart, severe tachycardia, serious pulse deficit, and anuria; (2) unconsciousness, anorexia, aversion, vomiting, and gastro-intestinal surgery all preclude oral medication; (3) to secure rapid effect in severe cardiac insufficiency to prevent progressive damage due to pulmonary edema with resulting anoxemia, edema, and ischemia of heart muscle; (4) initial intense effect is desired at times in auricular fibrillation and auricular flutter with a rapid ventricular rate and certain supraventricular tachycardias especially in older patients; (5) enteral absorption is often poor in acute enteritis, hyperperistalsis, and inflammatory edema; (6) most important of all the period of hospitalization is shortened, a distinct economic advantage to the patient.

#### TOXICITY

The incidence of toxic reactions in the author's series of 78 cases has been previously mentioned. In a recent article Le-

vine<sup>14</sup> reported 338 patients receiving digitoxin from January 1, 1946, through April 1947, with 7 instances of toxic arrhythmias. This was contrasted to 5 instances of arrhythmias in 534 patients receiving digitalis leaf, which is certainly not a statistical difference. The clinical impression was that with digitoxin the rapid rhythms may develop more insidiously than with the leaf. Toxicity may not result entirely from excessive dosage. Other factors may be involved such as damaged musculature, severe valvular disease, with congestive or anginal failure. Burch and Ray,<sup>2</sup> in a review of myocarditis, report that myocardial degeneration may occur to some degree in almost any systemic disease, whether localized at a focus or generalized. In many instances minor electrocardiographic changes result such as premature contractions, but often severe disturbances in cardiac mechanism occur prior to medication with any drug. Digitalis often is blamed for these arrhythmias, and the presence of fever with resulting tachycardia further complicates the picture.

Levine<sup>14</sup> states that it will be difficult in the presence of a rising heart rate to decide whether it is due to progression of the disease process or to digitalis poisoning. Since digitalis perpetuates rather than terminates most arrhythmias, one should watch for a sudden change from an irregular to a regular rhythm indicating the development of idioventricular rhythm with complete auriculoventricular heart block or auriculoventricular dissociation. Master<sup>15</sup> recently reported 9 cases of digitoxin intoxication with nausea, vomiting, blurred vision, mental confusion, and cardiac irregularities, such as bigeminy, multifocal ventricular premature beats, tachycardias, flutter, fibrillation, and heart block. Review of these cases reveals that digitoxin was given in rather large doses in spite of previous recent digitalis medication. Also some of the patients would have benefited from strict low sodium diets and mercurials rather than additional digitoxin. In one instance, simultaneous digitoxin and a 2 cc. dose of mercurhydrin were given, a com-



bination which produced immediate toxicity when the previous amount of digitoxin was uncertain. It would seem that when an initial large dose of any digitalis preparation is given it would be best to withhold mercurials until an adequate history is obtained or until an average digitalizing dose has been given. Sudden mobilization of large amounts of edema fluid will most certainly lead to intoxication when such fluid contains digitalis. Rarely, toxic symptoms of a varying nature may be due to poisoning with other substances, such as lithium contained in the recently banned preparation Wes-Sal, a salt substitute.

Levine<sup>14</sup> suggests that a chemical method for determining the blood level of digitalis bodies might clarify the study of toxicity of the drug. The effect of digitalis on the healthy heart is deserving of further study also. Just as there are many preparations of digitalis leaf on the market sold under a variety of trade names, so there are many companies marketing digitoxin. It is not known for certain whether there are minor variations in strength even in the pure glycoside. It is the clinical impression of several workers that "digitalene nativele" is more potent than purodigin or crystodigin. Even so this minor variation does not compare to the wide variation in purity of leaf preparations. The use of so many trade names to market so potent a drug is to be condemned, since it adds to confusion and prevents proper clinical evaluation of the drug. It is felt that the clinician should choose one digitoxin preparation for routine office and hospital use.

It is no longer possible to obtain a history of previous digitalis medication by asking a patient the color, size, or shape of a tablet he is taking. Digitalis leaf and digitoxin are sold in all colors and in varying strengths making visual recognition impossible. A physician will often deliberately avoid telling a patient he is taking digitalis to obviate psychic trauma. Many patients conscious that they are taking digitalis will modify without instructions their own daily dose. It cannot be denied that a pure glycoside like digitoxin will under

such circumstances cause insidious toxic reactions. To avoid toxicity it would be advisable to use 0.1 mg. digitoxin as a daily maintenance dose increasing the dose to 0.2 mg. or alternating the two doses as the clinical situation demanded. This would seem preferable to the method of using 0.2 mg. daily as employed by Gold and the author reducing the dose to 0.1 mg. as toxic signs developed. However the incidence of toxic reactions was not great even in the latter method. The use of the electrocardiogram to gauge dosage is not acceptable except for the arrhythmias since the typical S T-T shift may be present after very small doses or may be absent even after therapeutic doses.

#### DISCUSSION

From the above presentation it is evident that the same degree of digitalization cannot be obtained in all patients with the same single or divided doses. Further study seems indicated with various dosage technics including the single large dose as advocated by Gold; a multiple dose method consisting of a single large dose such as 0.6 mg. followed by smaller amounts at four to six hour intervals; and slow digitalization with daily single doses such as 0.4 mg. In this way sufficient data will be accumulated to enable physicians to depend on digitoxin as they have throughout the years on digitalis leaf. In patients with auricular fibrillation the apical rate serves as a guide to proper dosage and one rarely approaches the toxic state. Unfortunately patients with sinus rhythm who have cardiac insufficiency are more difficult to follow especially in the face of a slow ventricular rate. This last group includes many of the Grade IV congestive failures who need more rigid management rather than more digitoxin. It may be later shown that the daily maintenance dose of digitoxin lies somewhere between 0.1 mg. and 0.2 mg. and the size of existing tablets will have to be changed for the sake of simplicity and easier management of the less intelligent patient.

De Graff, Batterman and Rose<sup>3</sup> believe that the factor of absorbability from the

gastrointestinal tract is being overemphasized. As long as absorption occurs and the drug is given at intervals to avoid dissipation, sufficient accumulation will result. Faster digitalization will not result even with a more completely absorbed preparation unless the glycoside has a shorter latent period of action. Clinically, digitoxin given orally requires a shorter time for digitalization than digitalis leaf. However, variability in absorption may influence the determination of a maintenance dose of a digitalis drug. While there is some range of safety between the minimum optimum maintenance dose and a toxic dose, the former is the goal toward which we strive in order to spare the patient unpleasant reactions. It should be noted at this point that many older patients are unable to take even suboptimal doses of the leaf or digitoxin without becoming confused and at times even disoriented. This will make more difficult clinical recognition of toxicity.

Included in any discussion of the desirability of a drug is the cost to the clinic patient. The time honored leaf preparations are somewhat cheaper, but as more digitoxin is manufactured the cost will undoubtedly drop. In the average drug store 1.2 mg. of digitoxin sells for approximately 24 cents while 1.2 mg. of the leaf is about 14 cents. The price of 50 tablets of the leaf is around \$1.00, while that of 50 tablets of 0.2 mg. of digitoxin is about \$2.00. The out-patient drug department of a hospital, can greatly reduce this rate to a clinic patient.

In general, it may be stated that both digitalis leaf and digitoxin have a definite place in the management of patients with acute and chronic cardiac insufficiency. Where speed of action is not deemed necessary it remains to be demonstrated that digitoxin possesses definite advantage over the leaf preparations. In acute cardiac failure rapid digitalization by the oral or intravenous route seems indicated to avoid undue suffering and terminate an unphysiological state. Unfair criticism of digitoxin based on small groups of cases poorly con-

trolled and improperly followed up will give the average practitioner fear of a pure and useful drug. Following the original work of Gold and his associates the pendulum swung too far to the digitoxin side without proper knowledge of the cumulative effect of the drug. The present trend to resume use of the leaf preparations and abandon digitoxin because the latter fails to give warning symptoms seems hardly justifiable. A brief table of comparison (Table III) will serve to emphasize a few important points. In a discussion of this sort one should not lose sight of the glycosides of digitalis that stand intermediate between the leaf preparations and digitoxin. These include cedilanid and digoxin which seem to have certain indications not in the scope of this discussion.

#### SUMMARY

1. A comparative study of digitoxin and digitalis leaf was presented in an attempt to simplify selection and proper use of these drugs for the busy clinician.
2. Seventy-eight cases of cardiac insufficiency treated with digitoxin were added to the existing literature.
3. Important factors in digitoxin dosage and indications for the use of intravenous digitoxin were outlined.
4. The multiple dose technic requiring twenty-four to thirty-six hours was employed in the author's series of cases.
5. The average amount of digitoxin required in the 78 cases for reduction of the ventricular rate to a normal range varied from 1.4 mg. to 1.8 mg.
6. Toxic signs encountered included 6 instances of nausea and 5 disturbances of the cardiac mechanism. No serious arrhythmias were encountered in patients followed fifteen to twenty-five months.
7. Although 0.2 mg. of digitoxin was used as a daily maintenance dose in most instances, it would appear that 0.1 mg. daily should be tried and the dose increased as indicated.
8. Further extensive experimental and clinical trial of digitoxin seems warranted.



TABLE III  
TABLE OF COMPARISON

	DIGITOXIN	DIGITALIS LEAF
Preparation	Digitaline nativele Purodigin Digisidin Unidigin Digitoxin	Tab. digitalis leaf Digifoline Digiglusin
Plant source	Dig. purpurea	Dig. purpurea or Lan.
Absorption from G-I Tract	Practically complete	Irregular
Composition	Pure product	Active principle plus rennins, saponins, etc.
Method of administration	Oral and intravenous	Oral and intramuscular
Amt. equiv. to one unit	0.1—0.2mg.	75 mg.
Duration effect of single dig. dose	3 days plus.	3 days plus.
Average oral dig. dose	1.2—2.0mg.	1500—2000 mg.
Average I-V dose	1.2mg.	.....
Daily average maint. dose	0.1—0.2mg.	100—200 mg.
Toxic manifestations of importance	More insidious onset, nausea and vomiting. Sudden change rhythm, arrhythmias	Early onset of nausea, vomiting, diarrhea.
Advantages	May be used I-V when rapidity of action needed. Oral absorption of a single digitalizing dose	Less insidious onset toxic mani- festations. Safer for patients of clinic type seen infre- quently. Cheaper.

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# THE VALUE OF ELECTROENCEPHALOGRAPHY IN DIAGNOSIS OF BRAIN TUMORS

COMPARISON WITH OTHER COMMONLY  
USED TECHNIQUES\*

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SHREVEPORT

In 1935 Professor E. D. Adrian discussed the abstract concept of the electrical activity of the brain<sup>1</sup> before the Royal Society of Medicine in England and forecast that this technic *might* some day be of value to the clinician. It was only a little over a year later that W. Gray Walter<sup>10</sup> described his technic for localizing brain tumors by means of the infant science of electroencephalography. Now, only fifteen years later, we are concerned not with whether the electroencephalogram is normal or abnormal in brain tumors but with the ac-

curacy with which this method can determine the site and probable histologic type of the neoplasm. Truly the progress in the field of electroencephalography has been as astonishingly rapid as in the more publicized fields of antibiotics and chemotherapy.

Table 1 summarizes the findings of previous investigators as to the accuracy of various technics in brain tumors. The groups studied by Cobb,<sup>3</sup> Hoefer,<sup>6</sup> Paillas<sup>8</sup> and Yeager<sup>11</sup> contained some non-neoplastic expanding lesions and it was possible to revise the statistics to exclude these in the cases marked with an asterisk. Yeager's<sup>11</sup> study was concerned only with frontal lobe lesions and Kershman's<sup>7</sup> only with supratentorial lesions. Hoefer's<sup>6</sup> entire group numbered 543 and the figures in Table 1 for the air studies and plain skull roentgenograms are based on this number. He did not report statistics for the electroencephalogram for the entire group and the figures

TABLE 1  
FINDINGS OF OTHER INVESTIGATORS

AUTHOR	REFERENCE	YEAR	NUMBER OF CASES	ELECTROENCEPHALOGRAM					
				NORMAL	CORRECT LATERALIZATION	CORRECT LOCALIZATION	CORRECT GROWTH SITED	SKULL X-RAY CORRECT LOCALIZATION	AIR STUDIES CORRECT LOCALIZATION
				%	%	%	%	%	%
Cobb*	3	1944	120	13	48	37	---	---	---
Yeager	11	1945	100	2	98	76	---	---	---
Hoefer*	6	1946	324*	---	76	66	---	17	90*
Aird	2	1946	?	---	78	---	---	20	83
Schlesinger	9	1947	108	---	70	---	---	---	---
Paillas	8	1948	116	10	---	65	74	---	82
Cuneo	4	1949	40*	10	79	63	---	---	---
Kershman	7	1949	100	---	97	77	---	---	---
Present Study	---	1949	62	10	81	57	34	25	79

\*See text for explanation of adjustment in these figures.

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shown in the table are based on his group of gliomas and meningiomas. Cuneo<sup>4</sup> has only reported 19 of his 40 cases so far (malignant gliomas and meningiomas), and it is on these that the figures shown are based. Paillas<sup>8</sup> is the only author reporting the comparative accuracy of clinical measures which he found to localize the



lesion with fair accuracy in 69 per cent. Yeager,<sup>11</sup> Kershman<sup>7</sup> and Hoefer<sup>6</sup> all report incorrect lateralization of the lesion in 1 to 3 per cent of their groups.

It is the purpose of this study to compare the relative diagnostic accuracy of the clinical examination and history, the ordinary skull roentgenogram, air studies of the brain and electroencephalography. The comparison will be on the basis of the ability of these various technics to predict the side of the brain involved by the tumor, the area of the brain involved, and the speed of growth of the tumor.

#### TECHNIC OF ELECTROENCEPHALOGRAPHY

Electroencephalographic recordings (EEG's) were made with three to eight channel ink-writing electroencephalographs. The paper speed was 30 millimeters per second. Small hollow solder electrodes were filled with saline paste after being affixed to the scalp in the frontal, central, and occipital areas (about 3 centimeters from the midline) and in the midtemporal areas. Additional electrodes were added as seemed necessary. Scalp-to-ear ("monopolar") and scalp-to-scalp ("bipolar") recordings were obtained in all cases. In the earlier records the ear electrodes were interconnected and grounded, but in later records they were independent and ungrounded. Special reference electrodes (such as contralateral ear, vertex, tip of nose, and nasopharyngeal,) were used in many instances. Only a few records were obtained with the patient asleep.

The clinical information about the patient (unfortunately sometimes very meager) was known to the technicians at the time they obtained the electroencephalogram; so they were able to apply any extra electrodes needed and to use any special technics indicated in order to insure the best localization possible.

The electroencephalograms so obtained were then subjected to two operations. The first was the "interpretation". This was carried out without any knowledge whatsoever of the clinical information. On the basis of this interpretation the record was classified as normal, borderline, or ab-

normal. Records with a questionable focus were classified as borderline and those with a definite focus as abnormal. If the record warranted it a statement as to the side and the exact location of the focal change was made. After the "interpretation" had been recorded the second operation, the "correlation", was carried out. The clinical information available on the request form was consulted, and an opinion was rendered on the basis of a synthesis of the clinical and electroencephalographic findings. In the case of suspected brain tumors an opinion was usually rendered as to whether the lesion was an expanding one or not and as to its probable type.

#### MATERIAL

Sixty-two patients suffering from neoplasms of the brain constitute the basis of this study. In all instances the location and histologic type was determined by operation and biopsy and or by autopsy. The various types of tumors encountered in this study were as follows: astrocytomas 37 per cent, meningiomas 21 per cent, glioblastomas multiforme 18 per cent, angiomas 7 per cent, granulomas 5 per cent, astroblastomas, spongioblastomas polare, oligodendrogliomas, and metastatic carcinomas 3.5 per cent each. There was one case each of pituitary adenoma, dermoid, and acoustic neurinoma.

Fifty-six of the tumors were supratentorial and 6 were infratentorial. The relatively high percentage of "benign" tumors in this series is due to the fact that in many instances patients having glioblastomas multiforme were so acutely ill that immediate craniotomy was necessary, or the diagnosis was so obvious that electroencephalography was not deemed necessary.

#### METHOD

Whenever possible a prediction was made according to each technic of the side involved by the lesion, the area it involved, and the probable speed of growth.

The "clinical diagnosis" was the diagnosis given by a competent examiner in the neurologic field before roentgenograms or electroencephalograms were made. In instances where no such diagnosis was expressed, the case was rediagnosed on the

basis of all available information as to history and as to physical and neurologic examination. Lateralization and localization were determined in the usual manner. If the symptoms and signs attributable to the tumor were of less than nine to twelve months in duration the lesion was usually considered to be rapidly growing.

All roentgenograms available were obtained, and the majority were reinterpreted without any knowledge of the clinical or electroencephalographic findings.

In reviewing plain roentgenograms of the skull lateralization and localization was determined by displacement of normally calcified intracranial structures, by the presence of localized increase in vascular markings. Erosion of the dorsum sellae, widening of the sutures, convolutional atrophy, and abnormal calcifications were considered in determining the speed of growth.

In the pneumoencephalogram and ventriculogram the degree of displacement of the ventricles and the probable size of the lesion were considered in conjunction with the factors mentioned for the plain skull roentgenogram in determining the speed of growth.

In the electroencephalogram the decision as to speed of growth was based on the slowness of the "delta" activity, the amount of 4-7/sec. activity present, the degree to which remote areas were affected by the abnormal waves (the amount of spread), the facility with which superficial phase reversals were obtained and the amount of normal activity mixed with the slow activity. The presence of focal fast activity or isolated rapid spikes was usually taken to indicate that the lesion was relatively slow in growth.

Procedures in which the results were more or less unsatisfactory for interpretation were included in these studies for it was felt that such inclusion would give a more accurate idea of the over-all value of the different technics.

As far as possible the same criteria of

lateralization and localization were used in determining the accuracy of all technics. Our criteria were probably more liberal than those of Hoefer<sup>6</sup> and Kershman.<sup>7</sup> The following are some illustrations of the extremes of correct and incorrect electroencephalographic lateralization and localization as determined by our criteria. Other illustrations will be given in the case reports:

Case No. 1. J. R. D.; EEG showed delta focus in right centro-occipital region. Operation showed diffuse infiltrating astrocytoma in right frontoparietal area. Lateralization and localization correct.

Case No. 2. J. C. D.; EEG showed focal 2-3/sec. activity in frontal regions bilaterally; more on right, plus involvement of left temporal. Autopsy showed left deep frontal, subfrontal, and subtemporal astrocytoma near midline. EEG lateralization and localization correct.

Case No. 3. H. D. G.; EEG abnormally and diffusely slow with more slow waves in anterior half of left cerebrum. Autopsy showed glioblastoma infiltrating entire left frontal and part of parietal lobe. EEG lateralization and localization correct.

Case No. 4. C. J.; EEG showed pronounced reduction of potentials on entire right side. Operation showed oligodendroglioma in right parietal area. EEG lateralization correct, localization incorrect.

Case No. 5. C. D. J.; EEG showed separate slow foci in right frontal and occipital areas. Autopsy showed astrocytoma right temporal and inferior parietal lobe. EEG lateralization correct, localization incorrect.

#### RESULTS

Of the final electroencephalographic reports in the 62 patients, the classifications were as follows:

Normal . . . . .	6 Cases	10 per cent
Borderline . . . .	5 Cases	8 per cent
Abnormal . . . . .	50 Cases	80 per cent
Unreadable . . . .	1 Case	2 per cent

Fifty-one (82 per cent) of the records were focal; the focus was definite in 31 cases (50 per cent) and less definite in 20 cases (32 per cent).

Table 2 shows the accuracy of the various technics in the entire group of 62 intracranial tumors. It will be noted that the clinical diagnosis is not given as normal in



TABLE 2  
COMPARATIVE ACCURACY OF TECHNIQS,  
ALL INTRACRANIAL TUMORS

		Clinical Diagnosis (62 Cases)	Plain Skull X-Ray (59 Cases)	Air Studies (43 Cases)	EEG (62 Cases)
Normal		0%	41%	2%	10%
Nonlateralizing	Diffuse				
Abnormality		8%	17%	7%	11%
Lateralization:	Correct	77%	37%	91%	81%
	Incorrect	8%	3%	0%	0%
Localization:	Correct	69%	25%	79%	57%
	Incorrect	18%	7%	12%	21%
Speed of Growth:	Correct	65%	34%	58%	34%
	Incorrect	16%	7%	26%	26%

any instance; this, of course, being due to the fact that some abnormality was suspected or the patient would not have been undergoing the diagnostic procedures. In this group air studies were definitely superior to the clinical diagnosis and electroencephalogram in lateralization and localization, and the plain skull roentgenogram

was least valuable. The air study and clinical diagnosis were the only technics significantly useful in the prediction of the type of tumor, that is, its speed of growth.

If the posterior fossa tumors are removed from the group, the diagnostic accuracy of all of the technics improves in all categories (Table 3).

TABLE 3  
COMPARATIVE ACCURACY OF TECHNIQS  
ALL SUPRATENTORIAL TUMORS

		Clinical Diagnosis (56 Cases)	Plain Skull X-Ray (54 Cases)	Air Studies (39 Cases)	EEG (56 Cases)
Normal		0%	41%	3%	7%
Nonlateralizing	Diffuse				
Abnormality		9%	15%	0%	5%
Lateralization:	Correct	87%	41%	98%	89%
	Incorrect	5%	2%	0%	0%
Localization:	Correct	70%	30%	82%	63%
	Incorrect	18%	6%	13%	23%
Speed of Growth:	Correct	68%	37%	59%	33%
	Incorrect	16%	6%	28%	29%

Although the group of supratentorial glioblastomas is too small for accurate

statistical treatment (Table 4), it appears that in this group the plain skull roentgeno-

TABLE 4  
COMPARATIVE ACCURACY OF TECHNIQS  
SUPRATENTORIAL GLIOBLASTOMAS

		Clinical Diagnosis (10 Cases)	Plain Skull X-Ray (10 Cases)	Air Studies (8 Cases)	EEG (10 Cases)
Normal		0%	60%	0%	10%
Nonlateralizing	Diffuse				
Abnormality		0%	0%	0%	0%
Lateralization:	Correct	100%	40%	100%	90%
	Incorrect	0%	0%	0%	0%
Localization:	Correct	100%	10%	100%	80%
	Incorrect	0%	0%	0%	0%
Speed of Growth:	Correct	80%	40%	38%	0%
	Incorrect	20%	0%	50%	80%

gram is more likely to be normal and no more likely to be lateralizing than in other supratentorial tumors. In this small series the clinical diagnosis and air studies were perfect in lateralization and localization, and the electroencephalogram was highly accurate. Only the clinical features were a reliable indicator of the nature of the lesion, the electroencephalogram being useless or misleading.

In supratentorial astrocytomas (Table 5), a normal test or one showing diffuse abnormality was rare except in the plain skull roentgenogram. The air studies and electroencephalograms were uniformly correct in lateralizing the lesion; the clinical diagnosis was highly accurate and the plain skull roentgenogram was of much less value. Both clinical studies and the electroencephalogram localized the lesion correctly in 70 per cent of cases, but air studies were definitely superior to both. The difference between the technics in prediction of speed of growth was less marked in this group

than in others, the clinical diagnosis still being superior.

Plain roentgenograms of the skull were almost as useful in lateralization and localization and prediction of tumor type as the clinical findings in supratentorial meningiomas (Table 6) and were superior to the electroencephalogram in everything except lateralization. Again, air studies were as accurate or more accurate than all other technics.

Table 7 shows the accuracy of the electroencephalogram in the various types of neoplasms. Supratentorial astrocytomas were least likely to show a normal electroencephalogram and posterior fossa tumors most likely to produce diffuse nonlocalized abnormality. In no instance was a neoplasm lateralized to the wrong side. All supratentorial astrocytomas were correctly lateralized. Localization was best in the supratentorial glioblastomas and was very poor in the supratentorial meningiomas. The electroencephalogram in our hands did

TABLE 5  
COMPARATIVE ACCURACY OF TECHNICS  
SUPRATENTORIAL ASTROCYTOMAS

		Clinical Diagnosis (20 Cases)	Plain Skull X-Ray (20 Cases)	Air Studies (15 Cases)	EEG (20 Cases)
Normal		0%	45%	0%	5%
Nonlateralizing Diffuse Abnormality		5%	15%	0%	0%
Lateralization:	Correct	85%	35%	100%	100%
	Incorrect	5%	0%	0%	0%
Localization:	Correct	70%	15%	80%	70%
	Incorrect	15%	5%	20%	30%
Speed of Growth:	Correct	65%	30%	53%	50%
	Incorrect	20%	5%	33%	25%

TABLE 6  
COMPARATIVE ACCURACY OF TECHNICS  
SUPRATENTORIAL MENINGIOMAS

		Clinical Diagnosis (12 Cases)	Plain Skull X-Ray (11 Cases)	Air Studies (11 Cases)	EEG (12 Cases)
Normal		0%	9%	9%	8%
Nonlateralizing Diffuse Abnormality		8%	27%	0%	8%
Lateralization:	Correct	75%	64%	91%	83%
	Incorrect	17%	0%	0%	0%
Localization:	Correct	58%	55%	82%	33%
	Incorrect	33%	9%	9%	42%
Speed of Growth:	Correct	75%	64%	73%	33%
	Incorrect	0%	9%	9%	8%



TABLE 7  
ACCURACY OF EEG IN VARIOUS TYPES OF TUMOR

	NUMBER OF CASES	LATERALIZATION				LOCALIZATION				SPEED OF GROWTH		
		NORMAL	NOSLOCALIZED DIFFUSE ABNORMALITY	Correct	Incorrect	No Statement	Correct	Incorrect	No Statement	Correct	Incorrect	No Statement
All Tumors	62	10	11%	81%	0%	0%	57%	21%	3%	34%	26%	21%
Supratentorial Tumors	56	7	5%	89%	0%	0%	63%	23%	4%	38%	29%	23%
Supratentorial Glioblastomas	10	10	0%	90%	0%	0%	80%	0%	10%	0%	80%	10%
Supratentorial Astrocytomas	20	5	0%	100%	0%	0%	70%	30%	0%	50%	25%	25%
Supratentorial Meningiomas	12	8	8%	83%	0%	0%	33%	42%	8%	33%	8%	42%

not appear to offer any constructive help in determining the speed of growth of the tumor and sometimes might be misleading.

CASE REPORTS

Case No. 1. *Normal Electroencephalogram in Verified Neoplasm of Brain.* D. S., a 34 year old white female, began to have seizures, predominantly right sided, in February 1945. These increased in frequency in spite of appropriate medication. Neurologic examination on June 10, 1949, disclosed motor weakness, questionable sensory loss and hyper-reflexia on the entire right side. These abnormalities were most pronounced in the lower extremity. A clinical diagnosis of a slowly growing neoplasm of the left midfrontal region was made.

Roentgenograms of the skull obtained on March 29, 1949, showed large arterial channels on the left side. This study was interpreted as indicating a possible left frontal meningioma.

An electroencephalogram (Figure 1) obtained on March 29, 1949, revealed 11/sec. activity in 50 per cent of the occipital tracing symmetrically. The record was interpreted as normal. In retrospect, the fast activity in the left central area might have indicated a localized disturbance, but in the original interpretation it was felt that this was not distinctly outside normal limits.

A pneumoencephalogram performed on June 14, 1949, showed displacement of the ventricular system to the right side with depression of the anterior portion of the left lateral ventricle. This was interpreted as indicating an expanding intracranial lesion of the convexity of the left midfrontal region.

On June 14, 1949, operation disclosed a meningioma of the convexity of the left midfrontal region, partially buried in the cerebrum.

Case No. 2. *Brain Neoplasm Correctly Lateralized But Incorrectly Localized by EEG.* H. C. A., a 61 year old male, suddenly lost consciousness on June 9, 1947, and on recovering, a transient paresis of right face and right upper extremity was noted. Thereafter he had periodic hypersomnolence, convulsions, and personality changes but was able to continue in his profession. On December 17, 1947, examination disclosed mild organic brain deficit, slight defect in posture holding in the right upper extremity, and slight paresis of right face. The clinical diagnosis was a slowly growing left frontal lobe neoplasm, possibly a meningioma.

An electroencephalogram (Fig. 2) done on December 15, 1947, was interpreted as abnormal with diffuse slowing and with a focus of 1-2/sec. activity in the left anterior temporal or left inferior frontal region. No opinion was rendered as to the speed of growth of the lesion.

A pneumoencephalogram performed on December 18, 1947, showed displacement of the third ventricle to the right with depression of the body and anterior portion of the left lateral ventricle. The air study was interpreted as indicating a rapidly expanding lesion of the left frontal area.

Operation on December 22, 1947, disclosed a large left frontal xanthomatous type meningioma.

Case No. 3. *Bilateral Brain Neoplasm Correctly Localized by EEG.* C. D., a 49 year old female, began to have frontal and suboccipital headache of increasing severity in February 1949. In July 1949, she noted gradual onset of weakness in the right extremities, most pronounced in the hand and forearm. Her vision had been failing for six weeks and had progressed to complete blindness at the time of her admission to the hospital on September 12, 1949. Examination disclosed motor weakness and pyramidal tract signs on the right. A

FIG. 1

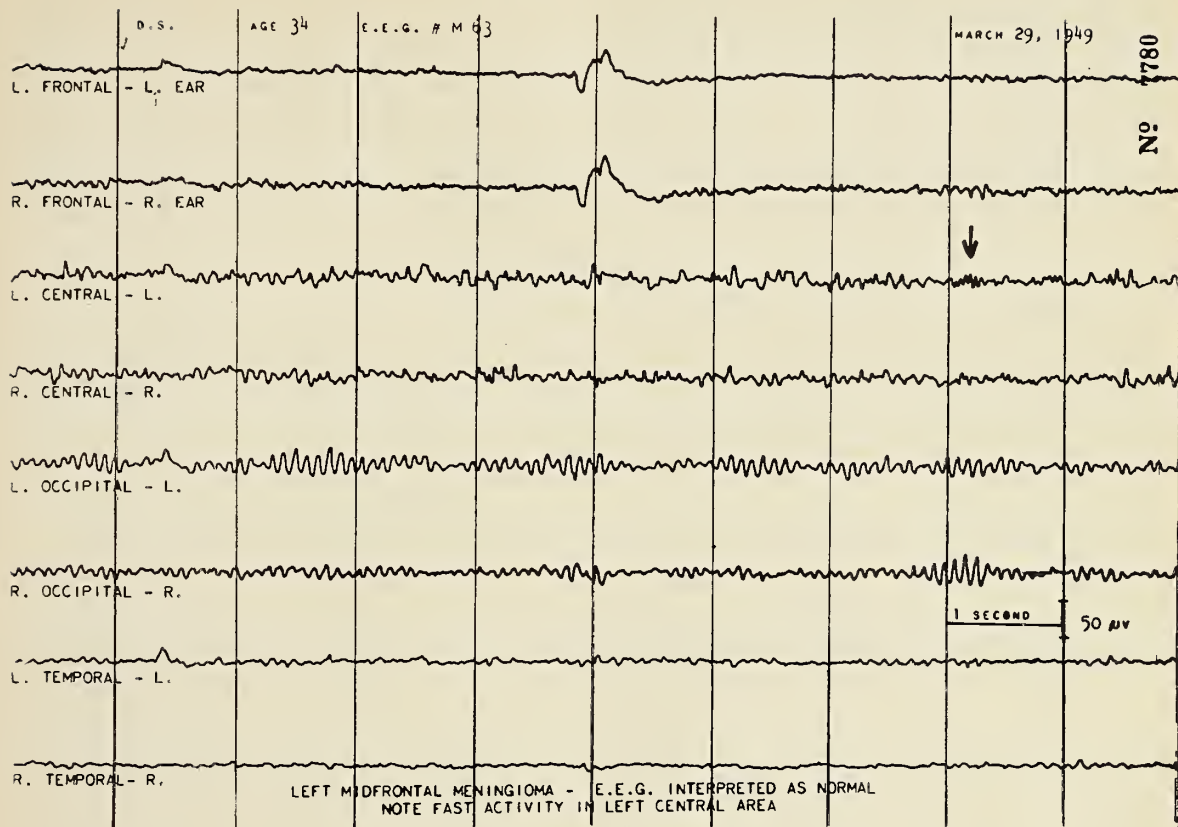
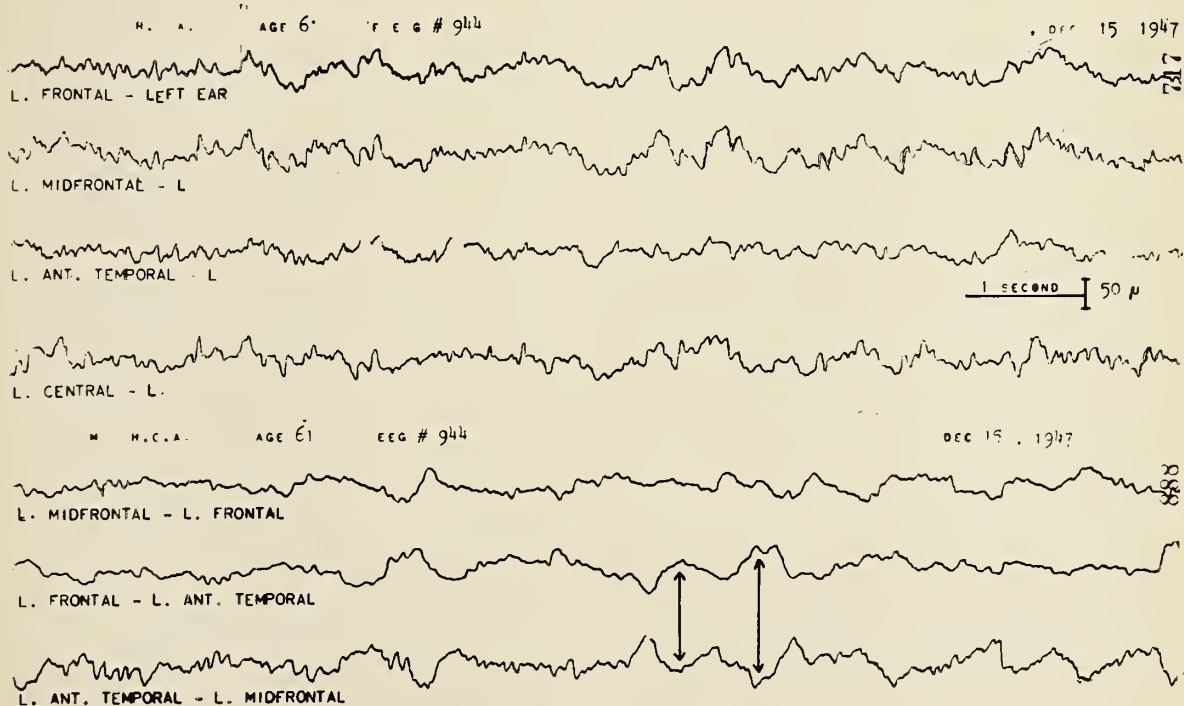


FIG. 2



LEFT FRONTAL LOBE MENINGIOMA  
INCORRECTLY LOCALIZED TO LEFT ANTERIOR TEMPORAL AREA



Babinski sign was also present on the left. Two or three diopters of papilledema were present bilaterally. General physical examination was normal. The clinical diagnosis was a bilateral parasagittal meningioma.

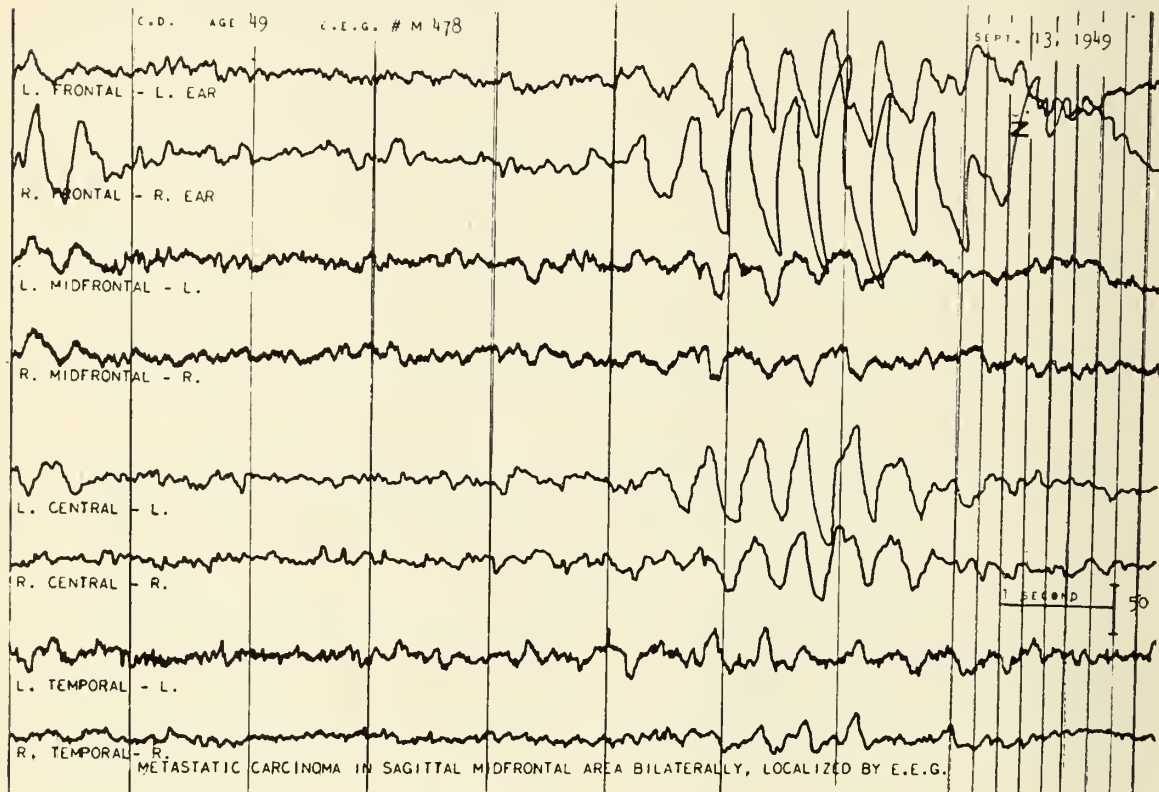
Roentgenograms of the skull on September 18, 1949, showed no abnormality.

A pneumoencephalogram was unsatisfactory due to lack of filling of the ventricles.

An electroencephalogram (Figure 3) done on

reported in the literature, air studies were superior to other measures in lateralization and localization of intracranial neoplasms. In spite of their great accuracy air studies, even in the best hands, are hazardous to patients with expanding intracranial lesions while the plain skull roentgenograms, clinical examination and the electroenceph-

FIG. 3



September 13, 1949, showed very high voltage, 2.2/sec. activity in the frontal and central areas bilaterally with a relative absence of this activity in the midfrontal areas. These slow waves appeared paroxysmally. Transverse runs indicated that there was slightly more abnormality on the left. The record was interpreted as abnormal with a focal disturbance in the midfrontal parasagittal area bilaterally, more on the left. It was felt that the record indicated a relatively benign type of expanding intracranial lesion.

Operation on September 19, 1949, disclosed a mass in the mid and posterior frontal sagittal area bilaterally, more pronounced on the left. It had the gross appearance of a meningioma. Histologic study revealed it to be a metastatic carcinoma and further studies indicated it was a bronchogenic carcinoma.

#### COMMENT AND DISCUSSION

In this series of cases, and in all others

alogram are not. We agree with Paillas<sup>6</sup> and others that when any two of the latter three technics are in complete agreement as to localization it should frequently be possible to by-pass the relatively shocking procedure of air study. In this series the plain skull roentgenogram together with the clinical features frequently indicated the correct diagnosis in the long standing lesions which were likely to be calcified and to cause pineal displacement. In the more rapidly growing lesions the clinical features and the electroencephalogram together usually disclosed the site and nature of the lesion. Air studies were frequently necessary to

disclose the anatomical location in basal and deeply placed lesions.

Our studies indicate that the clinical diagnosis is the most reliable indicator of the speed of growth or type of neoplasm present. We did not find the electroencephalogram nearly as reliable an indicator of type as did Paillas.<sup>8</sup> Our low accuracy in this regard indicates the necessity of revising our criteria for differentiation of type and speed of growth.

It is not possible to draw an exact comparison between our results as to lateralization and localization and those of other investigators (Table 1) due to differences in material, technic and statistical method. For instance, our figures and those of Hoefer<sup>6</sup> are similar but his criteria were somewhat more strict than ours. He considered that tumors in which only a biopsy was done had been lateralized but not localized, but we considered them to have been correctly localized if the site of the verifying biopsy coincided with the electroencephalographic localization. Cobb's<sup>3</sup> figures show an accuracy considerably less than that in ours, but this is certainly due in part to the fact that he had only two channel apparatus available.

Even considering the above mentioned differences in technic of electroencephalography, there remains a significant difference between the reported series which needs explanation. Some of the factors contributing to this difference will now be discussed.

Of prime importance is the factor of experience and progressive refinement of technical and interpretative method. In this connection it is interesting to note that the accuracy of localization year by year in this group of tumors breaks down in the following fashion:

The number of normal records obtained decreased from 20 per cent in the first year to 9 per cent in the third year, and diffuse nonlocalizing type records were also less frequent. There was little change in ability to lateralize the lesion but localization increased from 53 per cent in the first year to 61 per cent in the second and 64 per cent

in the third. In contrast, the accurate prediction of speed of growth declined from year to year. It appears that the deficiency in accuracy of localization in our series was due in part to inadequate technical procedures, and inadequate interpretation, and that this can be counteracted by increasing experience and refinement of technic.

Next should be considered the apparatus available. In records obtained using three or four channel apparatus, lateralization was correct in 77 per cent and localization in 51 per cent. In records obtained using an eight channel electroencephalograph the lesion was lateralized correctly in 94 per cent and localized in 73 per cent.

Few if any electroencephalographic laboratories would consider furnishing an electroencephalographic report without attempting to correlate their findings with the clinical information available. We agree with Kershman<sup>7</sup> that the so-called "blind analysis" alone has little clinical value. We do, however, disagree with those who maintain it is good practice to completely familiarize oneself with the clinical features prior to reading the electroencephalogram. It is all too easy to search out in a record what one wishes to find. This whole question probably resolves itself into the problem of "too liberal interpretation of the electroencephalogram" which has been discussed by Finley.<sup>5</sup> We recommend that the electroencephalographer commit himself as to localization and lateralization without reference to clinical findings and make any revision necessary. It is our feeling that this technic is the best compromise between the policy of blind analysis on the one hand and the excessive use of clinical information on the other. The answer to what is the best procedure will probably not become clear until several series of reports on the findings in "suspected" brain tumors have been reported. If such series contain an excessive number of false positive reports pointing to brain neoplasms when none exist, then our contention as to the proper manner of using clinical information will be vindicated.

In several instances the electroencephal-



ogram was obtained on the day the patient was admitted to the hospital, fatigued, excited, and in some instances after a long gruelling trip. In some of these cases the localization on the day of admission was imperfect, but a repeat study the next day with the patient more rested, less excited, and in better physical condition showed a much more precise localization. It seems probable that electroencephalographic laboratories might find it useful to obtain the electroencephalogram after a period of preliminary rest and relaxation such as is standard practice in obtaining the basal metabolic rate and the electrocardiogram.

#### SUMMARY

The clinical diagnosis, plain roentgenograms of the skull, air studies and electroencephalograms of 62 patients with verified brain neoplasm were analyzed in regard to the ability of these various technics to predict the side on which the tumor occurred, its site and its speed of growth.

In the entire group of neoplasms in all areas, the air studies, though not without danger, were most accurate as to lateralization (91 per cent) and localization (79 per cent). The clinical features offered the best indicator of the speed of growth and probable histologic type of the lesion in all types of tumor, the plain skull films being a useful and nontraumatic adjunct in the very slowly growing calcified lesions.

The clinical aspects of the case plus the air studies gave the best results in posterior fossa lesions. Air studies were frequently the only clearly diagnostic test in midline and basal lesions. The diagnostic accuracy of all technics was greater in supratentorial than in posterior fossa lesions.

In the group of all intracranial tumors the electroencephalogram was able to lateralize the neoplasm in 81 per cent and localize its site in 57 per cent. In no instance

was the tumor lateralized to the incorrect side. Localization was best in supratentorial glioblastomas (80 per cent), next best in supratentorial astrocytomas (70 per cent), and poor in supratentorial meningiomas (33 per cent). When eight channel apparatus was used the accuracy of lateralization increased to 94 per cent and localization to 73 per cent. In our hands the electroencephalogram was not a reliable indicator of the speed of growth of the neoplasm or its probable histologic type.

The manner in which clinical information should be used in interpreting the electroencephalogram is discussed.

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# THE RELATIONSHIP BETWEEN HUMAN BREAST CARCINOMA AND SEX HORMONES\*

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There have been numerous laboratory observations which show rather clearly that estrogenic substances play a vital role in the production of cancer of the breast in the experimental animal, particularly the mouse.<sup>1-7</sup> Obviously, we are not permitted to make the analogy that, because such a relationship has been shown to obtain in the experimental animal, it necessarily is true in the case of human breast cancer. But equally obvious is the fact that such an interrelation has been shown to occur experimentally, and has raised the question of whether or not such a relationship does exist in the case of estrogens and human breast cancer.

Since we do not have a direct experimental approach in the study of human cancer, in order to determine the relationship between the sex hormones, particularly estrogens, and human breast cancer, we must approach the matter somewhat obliquely, by analyzing clinical data. Such a process of study is on the whole unsatisfactory, yet it is the best we have. When we are reduced, as we are in a study of this kind, to reporting and analyzing single cases as bearing upon the answer, it must be realized that such an approach is incomplete, inadequate, and inconclusive.

We can learn something of the relationship between the sex hormones and breast cancer, by analyzing two types of data: First, the relationship between breast cancer and the removal of the principal endogenous source of the sex hormones, namely, the gonads (the ovaries in the female and

the testes in the male); and secondly, the relationship between breast cancer and the administration of estrogens and androgens.

## RELATIONSHIP BETWEEN BREAST CANCER AND REMOVAL OF GONADS

There have been any number of clinical observations which rather definitely show that, in cancer of the breast in women who are still menstruating, if the ovaries are removed a regression or improvement can be expected in approximately one-third of the cases.<sup>8-11</sup> Apparently this effect is due to the removal of the principal source of endogenous estrogens. It makes no difference whether this estrogenic source is removed or nullified by surgical castration, by x-ray castration<sup>12, 13</sup> or by physiological neutralization by administration of the antagonistic hormone, namely androgen,<sup>14-17</sup> the result is approximately the same. Even in males it has been found that in advanced carcinoma with metastasis, if orchidectomy is done, a regression can be expected in a number of cases.<sup>18, 19</sup> Treves<sup>20</sup> in a recent review of this problem, points out that there have been too few reports to make any statistical analysis, but the fact remains that orchidectomy can be expected to cause regression in a definite number of cases. Curiously enough, in contradistinction to what occurs in the female, administration of the female sex hormone does not seem to have the same effect as orchidectomy.

Since there is ample clinical evidence to suggest that the removal of the gonads does not affect cancer of the breast, the question naturally next arises whether or not these gonads, or their hormones, were responsible in any way for the initiation of cancer. This is considerably more difficult to answer on the grounds of clinical analysis. Regarding males, we have no information whatsoever. The number of young male castrates is so few, and the frequency of male breast cancer is so low, that we simply have nothing upon which to base an opinion. Even in women, we are somewhat limited in our material, particularly since gynecologists, quite properly, try to preserve a functioning ovary whenever possible; but despite these handicaps, there are one or two

\*Read before the Surgical Association of Louisiana, Nov. 11, 1949.

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This investigation was done under the auspices of the Therapeutic Trials Committee of the Council on Pharmacy and Chemistry of the American Medical Association as part of its collaborative study of steroids and cancer.



studies which are suggestive and bear upon this question. Thus Herrell<sup>21</sup> analyzed two groups of women in the same age group, one consisting of 1,906 women who had developed cancer of the breast, the other consisting of 1,011 women who had not developed cancer of the breast. He found that in the group of women who had developed cancer, the rate of castration,—that is, the number of women who had had their ovaries removed prior to the onset of the tumor of the breast—was 1.5 per cent, whereas the castration rate in the women who had not developed cancer was 15.4 per cent. In other words, there were ten times as many castrates in the group of women who did not develop cancer, as in the group that did develop cancer, indicating in a rough sort of way, that castration seemed to protect a certain number of women against the development of cancer. Looking at it the other way, there is the report of Olch,<sup>22</sup> who pointed out that normally only 28 per cent of women are still menstruating at the age of 50, but that in a group of women who had cancer of the breast, some 55 per cent are still menstruating at the age of 50, indicating rather definitely that the continued estrogenic function of the ovary increased the likelihood of those women, destined to develop cancer, to become so afflicted. Castration possibly protects women from developing cancer until such time as the adrenals can take over the production of sufficient estrogenic substance. There is some experimental basis for such an hypothesis.<sup>23</sup>

RELATIONSHIP BETWEEN BREAST CANCER AND  
THE ADMINISTRATION OF ESTROGENS  
AND ANDROGENS

The original work of Doisy and Allen in 1923 indicated that estrogens have a growth stimulating property, possibly mediated through the pituitary. Therefore, it was not surprising when estrogens seemed to flare up cases of breast cancer, nor was it difficult to explain the fulminant nature of cancer of the breast in pregnancy, which is known to be associated with a high estrogen level. However, in 1942, a number of English investigators, notably Badger,<sup>24</sup> in-

vestigating the properties of estrogens, found that they not only had a growth stimulating property, but they had a growth inhibiting property; therefore, a group of English clinicians led by Haddow,<sup>25</sup> decided to try what seemed at first to be an illogical, and possibly a harmful procedure, and that is, to treat cases of breast cancer with estrogens. And much to their surprise they found that, while it was true that frequently, although not invariably, estrogens seemed to flare up or make worse a cancer of the breast in a menstruating woman, that in women who had passed the menopause there was, in about a third of the cases, clinical regression. This observation has been amply verified by numerous other observers.<sup>26-28</sup> It is not known why estrogens seem to have a growth stimulating effect in the menstruating woman and a growth inhibiting effect in the post menopausal women. It is not too difficult to understand the action of androgens when administered in the menstruating woman, because it apparently produces a physiological castration, and thus causes an improvement. In the postmenopausal woman, androgens seem to work parallel with estrogens, although they are not so effective, estrogens being equally as effective as androgens in bone lesions and twice as effective as androgens in soft tissue lesions. One has the distinct impression that estrogens are the more important of the two sex hormones, and that we do use androgens only in those cases where it is important to remove this growth stimulating effect of estrogens.

Since Lacassagne,<sup>2</sup> in 1932, first produced cancer in the experimental animal by the use of estrogens, it has been a constantly discussed question whether or not estrogenic substances, which are so widespreadly used clinically, are capable of producing cancer in the human breast. There have been a number of reports<sup>29-32</sup> purporting to show that women receiving estrogenic substances did develop breast cancer, but one cannot eliminate the strong arm of coincidence. When one considers the widespread use of estrogens and the frequency of breast

cancer, the surprising thing would be if none of them developed breast cancer; and there is always a possibility that estrogens so administered, might flare up a latent or early cancer and bring it to clinical prominence. We know that estrogens can do this.

Two case reports that seem to be considerably more significant, were made by Abramson and Warshawsky<sup>33</sup> in 1948, and Howard and Grosjean<sup>34</sup> in 1949. These concern the development of breast cancer in the male. Each of them reported a male with cancer of the prostate to whom stilbestrol was administered. In one case in excess of 1,000 mgms. was received and in the other in excess of 40,000 mgms. In each case bilateral mammary tumors, developed which were sectioned and found to be consistent, histologically, with breast carcinoma, and these cases were so reported as bilateral mammary cancer induced by estrogen administration. We might have been inclined to place more credence on these reports, if we had not had an opportunity to observe a case which has been studied by Campbell and Cummins.<sup>35</sup> They had a man who had cancer of the prostate to whom they administered stilbestrol to control this disease, and after he had re-

ceived in excess of 7,000 mgms, he developed bilateral mammary tumors, which, on section, were found to be histologically indistinguishable from a medullary carcinoma of the breast. However, they made special stains of this tissue for acid phosphatase and found that this was not breast tissue at all, but was metastatic prostatic tissue. Had they not made these special stains, they might have been led to the false conclusion that they had produced bilateral mammary carcinoma. So we see there is little evidence to indicate that estrogens in the usually administered clinical doses are capable of inducing breast cancer.

#### REPORT OF CASES

Table 1 summarizes observations made on 28 cases of advanced breast cancer, which have been treated solely by the use of sex steroids. This study was begun on March 24, 1948, and since that time we have had 28 cases with periods of observation varying from one to eighteen months. Eighteen of these cases have been treated with estrogens, 9 have been treated with androgens and 1 was treated with estrogen and later changed to androgen. Of these 28 cases, 4 (14.8 per cent) were still alive at the time of the analysis and had shown soft

TABLE I  
OBSERVATIONS ON 28 CASES OF ADVANCED BREAST CARCINOMA

Period of study from March 24, 1948 to October 1, 1949.	
Length of observation on cases varied from 1-18 months.	
Number of cases in study to date: 28 cases.	
Estrogen treated: 18.	
Androgen treated: 9.	
Estrogen-Androgen treated: 1.	
Number dead as of October 1, 1949: 17—	{ Estrogen Rx: 9 Androgen Rx: 8
Number alive as of October 1, 1949: 11—	{ Estrogen Rx: 8 Androgen Rx: 8 Estrogen-Androgen Rx: 1
Number in which bony metastasis: 14.	
Number in which improvement of bony metastases (X-ray) noted: 1.	
Number of cases still alive with regression of soft tissue lesion and marked symptomatic improvement: 4 (all estrogen Rx) (14.8%).	
Number of cases still alive with symptomatic improvement only: 4 (14.8%)	{ Estrogen Rx: 2 Androgen Rx: 1 Combined: 1
Number of cases showing no improvement though still alive: 2 (both estrogen Rx)	



tissue regression with marked symptomatic improvement. Another 4 (14.8 per cent) had shown symptomatic improvement only; in other words, clinical improvement had occurred in approximately 29 per cent of the cases. While a symptomatic improvement evidenced by increase of wellbeing, increase of weight, and relief of pain is very gratifying to the patient and to us, it is never so impressive or so convincing as objective improvement. The objective improvement has been of two types: regression in soft tissue lesions, as shown in Figure 1, and secondly, regression in lung and bone lesions which could be followed with the x-ray (Fig. 2, 3). Of this series there were 14 in which bone metastasis was noted, but in only 1 (treated with dimethyl ether of diethylstilbestrol) was there any bone regression noted. Similarly this case was the only one in which lung metastasis actually seemed to regress. The estrogens used have been dimethyl ether of diethyl stilbestrol, 15 mgm. a day, dimethyl ether of diethyl stilbestrol, 30 mgm. a day, and

testosterone propionate, 25 mgm., or 100 mgm. three times a week.

We have attempted to study some of the side effects of estrogen therapy. We early noted pigmentation of the nipple occurring in those cases which seemed to do well, and it has been our impression that when pigmentation of the nipple and creases around the breast and axillae occur during estrogen therapy that a good clinical response is likely to develop. We have studied 7 cases, with the help of Dr. Harry Trifon, of the gynecological service, in regard to vaginal smears. We only began this in the last few months, and have had some degree of selection, because a good many cases that were not doing well had already died before the study began, so that the cases studied were those that have been doing rather well, with the result that all the cases seemed to have a definite relationship between the vaginal smear and the clinical response, with one exception. This was a case which had a nice clinical response but yet showed a negative vaginal smear. This



A



B

Fig. 1: Soft tissue regression following 3 months' therapy with 15 mgm. daily diethylstilbestrol. Notice the areolar pigmentation in "B" an estrogenic side effect.

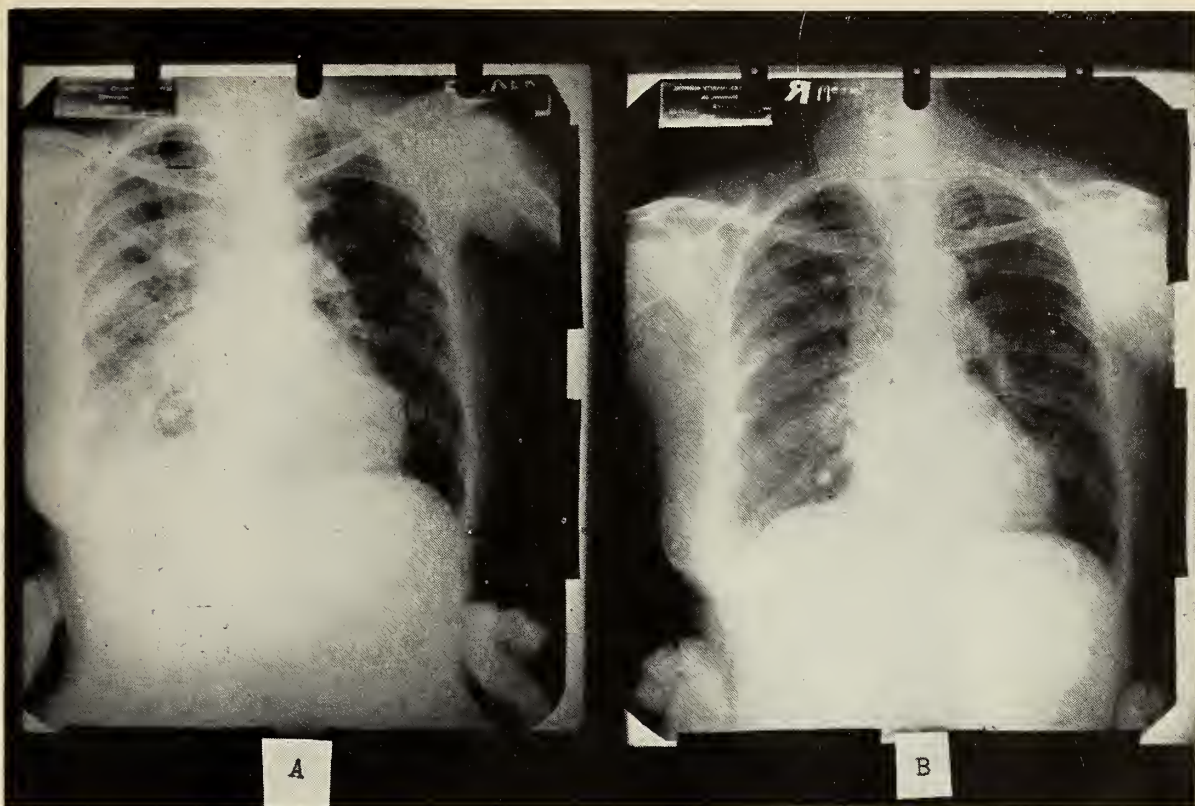


Fig. 2: Regression in pulmonary metastases after 7 months' therapy with 30 mgm. daily dimethyl ether of diethyl stilbestrol.

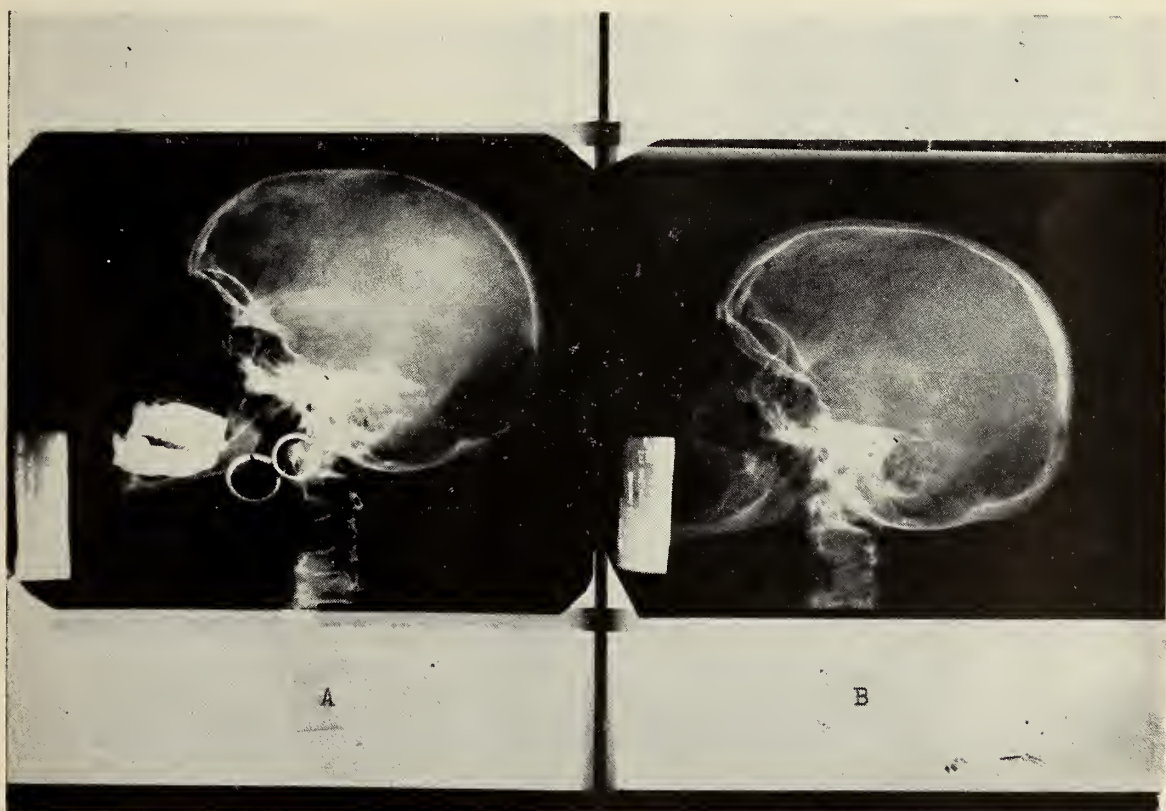


Fig. 3: Regression in osseous metastases after 7 months' therapy with 30 mgm. dimethyl ether diethylstilbestrol.



raises the question of whether or not it is always necessary to have a positive vaginal effect to get clinical response, or whether perhaps the dosage was not sufficient. Max Cutler reported<sup>36</sup> from the Chicago Tumor Institute 20 successive cases treated with estrogens in about one-third of which a clinical regression occurred, but in every one of his cases an estrogenic effect was noted on vaginal smear.

#### CONCLUSIONS

1. Estrogens and androgens when used in properly selected cases, have a profound influence on breast cancer and its metastasis in about one-third of the cases, but such an improvement is temporary.

2. There is some evidence to suggest that naturally occurring estrogens, either originating from the ovary or the adrenal, are concerned in the original breast malignancy.

3. There is no clinical evidence to date that indicates clearly that estrogens in the dosage at present utilized are capable of producing a breast malignancy.

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## THE DOCTOR, ORGANIZED MEDICINE, AND THE COMING POLITICAL CAMPAIGN

During the next six months the nation will experience a political campaign, the effects of which will extend far into the future, and will determine in some measure to what extent we move towards Socialism; along with this trend the campaign will determine in no small degree whether or not we move into the disastrous experiment of State Medicine. It is anticipated that the issue of State Medicine will openly be made a point of contention. We may expect those who believe in State Medicine, the Democratic party and the administration, to

make every effort to combat the views of organized medicine.

Quoting from Leone Baxter, General Manager, National Education Campaign, of the American Medical Association, "When a foremost National leader in the drive to discredit medicine, punches a foremost medical leader in the lapel with his forefinger and says, 'My friend, I'm going to beat medicine on this issue if it takes every power I possess!'" it is easy to see that the doctors must exert every effort to elect representatives favorable to their cause.

When we consider that the Department of Justice has indulged in what ample evidence has shown was a politically inspired attack on the profession, it is clear to all that whatever organized medicine does, and what the doctors as individuals do, must be ethically sound and legally correct. That we should have to be informed and instructed as to what is legally correct in fighting a political campaign, which we consider vital for our profession, comes somewhat as a surprise to many. The Department of Justice's investigation of the doctors, and these regulations that will be discussed here, give just a taste of how things might be under a tightly organized police state. This is what we will have over the whole nation, unless the present trend is corrected. It appears that there are certain limitations which have an important bearing on our actions, and which appear in the *Hatch Act*, the *Corrupt Practices Act*, and the *New Criminal Code*. An interpretation of these Federal laws has been secured at the request of the American Medical Association, National Education Campaign Committee, from the law firm of Kirkland, Fleming, Green, Martin, and Ellis. It is most important, therefore, that we heed many of the warnings and directions contained in this information recently sent out.

Among restrictions of importance are these:

1. It is imperative that doctors who are engaged in active support of candidates do so as individual citizens—and not under the auspices of their medical societies.

2. The American Medical Association



and its constituent societies cannot legally contribute or expend funds in support of, or in opposition to, candidates for Federal office.

3. The law prohibits a medical society from:

- a. Endorsing a candidate, when it involves expenditure of general corporate funds;
- b. Contributing funds to any candidate for Federal office;
- c. Using medical society letterheads or facilities to advance work in behalf of a candidate;
- d. Sponsoring any other form of advertising material for a candidate.

The Medical Society can, however, write to any member of Congress, or to other Federal officials, commending him on his stand on a medical issue. Or it can publish an editorial in its Journal, or official publication, commending him. But a Medical Society cannot endorse his candidacy when it involves expenditure of general corporate funds.

Whatever is done, therefore, by the doctor must be done by him as an individual. He cannot make use of any official position or office which he may hold in the organization. We are free, however, to aggressively further the candidacy of any qualified candidate for Federal office, and to actively oppose the candidacy of any candidate felt to be unqualified. This may be accomplished with other citizens by forming a group, on any level, acting as a political action committee. Such committees are best operated wholly within a single State. In such a case, they are not required to file detailed reports of expenditures and contributions. A committee operating in two or more States must file detailed statements. Individuals may contribute up to a maximum of \$5000 to, or on behalf of a candidate for Federal office. One may solicit and receive contributions for the same purpose, except from those persons who are prohibited from contributing, that is, from persons on relief, or from a person holding contracts with the Federal government.

One may solicit and receive contributions for the same purpose, except from those persons on relief, or from a person holding contracts with the Federal government. One may actively manage political campaigns, or participate in them by writing, speaking, or otherwise advocating a candidate's election, but still only as an individual. Anonymous handbills and pamphlets are both illegal and unethical. No corporation can contribute.

A doctor's privilege, therefore, at a time when our whole American way of life is threatened, is to become a crusading citizen. It is suggested that political action committees be formed, unconnected with organized medicine, to make every effort in conjunction with dentists and druggists to form a Healing Arts Committee. Such committees get contributions and form connections with other elements in the population who have interests similar to ours. These committees should be particularly active in furnishing the sense of direction for the professions in our community, to make every effort to get the vote registered and to get it out on time; and to finance its activity through collections from its own group. In organizing and functioning, these committees should clearly define the issues of the campaign, and secure publicity which would be directed towards favorable candidates.

In addition to the doctor's privileges and opportunities as a member of a political action committee, he still has opportunity for service in promoting these candidates' interests in his personal contact with his patients. The patients should be made to feel that his interest in the campaign is not a matter of political meddling, but an effort to stop Socialism, and incidentally, to conserve the private practice of medicine. His patients have confidence in him as a doctor. A few convincing explanations will give them confidence in him as a public-spirited citizen.

In the campaign ahead let every doctor conduct his activities wholly within the law,

## ORGANIZATION SECTION

**The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.**

***An informed profession should be a wise one.***

### ABSTRACTED MINUTES 1950 MEETING OF HOUSE OF DELEGATES LOUISIANA STATE MEDICAL SOCIETY

#### ROLL CALL

Eighty-four delegates; 16 officers and ten past presidents present.

#### MINUTES

Minutes of 1949 meeting of House of Delegates approved as recorded.

Minutes of meetings of Executive Committee since 1949 meeting of House of Delegates approved.

#### SPECIAL ORDER

Recognition of and thanks to Drs. E. M. Toler and R. E. King, members of the State Legislature.

Dr. Roy B. Harrison appointed to serve as Secretary for this meeting in absence of Dr. Talbot.

Appointment of Committees: Credentials—Dr. Wm. H. Roeling, New Orleans, Chairman; Drs. C. E. Boyd, Shreveport and Charles McVea, Baton Rouge. *President's Report*—Dr. C. M. Horton, Franklin, Chairman; Drs. Roy B. Harrison, New Orleans and E. L. Leckert, New Orleans. *Resolutions*—Dr. L. O. Clark, Lafayette, Chairman; Drs. N. J. Tessitore, New Orleans and T. A. Dekle, Jonesboro.

Roll of members who died since 1949 meeting read and members requested to stand in honor of these men.

Motion that Mr. Frank Smith, Mr. Jay Ketchum and Mr. Frank Lais, Jr., be allowed to attend sessions of the House, approved.

Recognition of Dr. L. C. Heare, fraternal delegate from State Medical Association of Texas.

#### COMMUNICATIONS

Dr. Talbot in re absence from meeting—Motion made and carried that message be sent to Dr. Talbot expressing regret in regard to his absence and hope for his improvement.

U. S. Army in re medical officers for overseas service—Received and filed.

Dr. A. A. Herold in re inability to attend meeting of House of Delegates—Received and filed.

Dr. W. M. Brumby in re Memorial to Dr. R. P. Ames—Motion made and carried that a committee be appointed, from the House of Delegates, to review the data submitted and report to the Executive Committee at its next meeting.

Commercial Casualty Co. in re group accident and health insurance—Motion made and carried that this subject be referred to the Committee on Public Health of the State of Louisiana.

Funds for bronze plaque of Sister Stanislaus—

Letter to be published in New Orleans Medical and Surgical Journal and Mr. Farwell to be advised of this action.

Dr. John Adriani in re Practice of Medicine by Hospitals as reported by the Hess Committee to the AMA House of Delegates—Motion made and carried that suggested resolution be adopted in principle, dependent upon action of legal counsel of AMA.

District Attorney of New Orleans in re reporting of deaths by physicians—Motion made and carried that communication be published in New Orleans Medical and Surgical Journal.

Dr. J. M. Funderburk in re qualifications of state health officer—Referred to Committee on Public Policy and Legislation.

#### REPORT OF OFFICERS AND COMMITTEES CONTAINING RECOMMENDATIONS

*President:* 1. It is recommended that a licensed physician be employed to act as Assistant Secretary-Treasurer. 2. It is recommended that the number of committees be reduced and the work of those remaining be definitely outlined and coordinated, thus preventing an existing overlapping of purposes—Following report of Committee on President's Report adopted—"The Committee on the President's Report wishes to accept the report as a whole and to approve the two recommendations contained in the report. We wish to commend particularly that part of the report referring to the necessity of continuing the fight against socialized medicine".

*Councilor of Third Congressional District:* 1. Consideration be given to division of the Third Congressional District—Motion made and carried, after discussion, that the subject be tabled.

*Councilor of Seventh Congressional District:* 1. Regular monthly meetings of each parish society—Accepted. 2. The Seventh District Medical Society continue to hold an annual two-day meeting in Lake Charles—Referred back to district for action.

*Committee on Blood Banks:* 1. The Louisiana State Medical Society encourage the development of local blood banks under the supervision of the American Association of Blood Banks—Approved. 2. A committee be appointed to consider ways and means for the development of a satisfactory system of blood banks in the State of Louisiana, under the joint supervision of the Louisiana State Medical Society and the American Association of Blood Banks and that this committee investigate the plan now in operation in the State of Florida. (It is the opinion of the Committee that this sys-



tem has many desirable features and might well be used as a guide).—Approved. 3. If the doctors of any community are convinced that the best interest of that community would be served by the establishment of a Red Cross Blood Bank in that locality, such action should not be disapproved or discouraged by the Louisiana State Medical Society—Approved.

*Committee on Cancer:* 1. The Cancer Committee be continued unchanged. 2. The remaining unused funds be used to distribute "Cancer—A Manual for Practitioners". 3. That \$1,500.00 be requested from the general fund for 1950—All three recommendations referred to the Committee on Public Health of the State of Louisiana.

*Committee on Committees:* Changes in Standing and Special Committees approved.

*Committee on Congressional Matters:* 1. Letters or telegrams of thanks be sent to each of the members of Congress from Louisiana expressing thanks for their cooperation during the past year—Approved. 2. The Editor of the New Orleans Medical and Surgical Journal be requested to write an editorial thanking the medical profession of the State of Louisiana for their sincere efforts in combatting adverse legislation throughout the Country—Approved.

*Committee on Insurance Examinations:* 1. A concerted effort be made to bring about a long overdue revision of fees by life insurance companies since some companies have not revised established medical fees for more than seventy-five years—not approved. 2. Minimum medical fee for "old line" insurance companies be fixed at ten dollars (\$10.00)—Not approved. 3. Minimum fee of fraternal life insurance companies likewise fixed at ten dollars (\$10.00)—Not approved. 4. Large policies should carry an additional fee—Not approved.

*Committee on Medical Testimony:* 1. Some consideration given and recommendations made with reference to laws concerning so-called sexual criminals—Referred to Committee on Public Policy and Legislation.

*Committee on Mental Health:* 1. That the law of commitment for the criminal insane be changed to conform with that of 1932; also that the law be altered in relation to release of alcoholics from state mental institutions—Referred to Committee on Public Policy and Legislation.

*Committee on Resolutions:* Recommendations that copy of report be included in minutes of this meeting and published in New Orleans Medical and Surgical Journal, approved.

*Committee on Veterans Administration Contract and Fee Schedule:* 1. A contract and fee schedule be established between the Louisiana State Medical Society and the Veterans Administration—Not approved. 2. Louisiana Physicians Service, Inc. be requested to act as administrative agent in setting up something along the lines of the so-called Michi-

gan Plan for operation in Louisiana—Not approved.

## REPORTS OF OFFICERS AND COMMITTEES CONTAINING NO RECOMMENDATIONS

Following reports received and filed: Secretary-Treasurer; Council; Councilors of First, Second, Fourth, Fifth, Sixth and Eighth Congressional Districts; Committees on Aid to Indigent Members, Applications for Doctors in Rural Communities, Budget and Finance, Diabetes, History of LSMS, Hospitals, Industrial Health, Journal, Juvenile Delinquency, Maternal Welfare, Medical Defense, Medical Education, Medical Indigency, National Emergency Medical Service, Public Policy and Legislation, Rural Medical Service, Scientific Work, Woman's Auxiliary.

### REPORT OF COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS

Received and filed.

### REPORT OF PLANNING BOARD IN RE SURVEY OF FACILITIES AND PERSONNEL FOR MEDICAL CARE

Received and filed.

### REPORT OF LOUISIANA PHYSICIANS SERVICE, INC.

Printed report accepted. Financial status reviewed; check for \$5,000.00 as part-payment of note to Louisiana State Medical Society presented to Secretary; requested release from escrow \$20,000.00 requested in 1949; introduced Mr. Frank Smith and Mr. Jay Ketchum, who made short talks; Dr. Owens announcement made in re exhibit of LPS in lobby of hotel. Motion made and carried that the President of LPS be thanked for report and that the State Society accept, with thanks, check for \$5,000.00.

### REPORT OF LOUISIANA STATE BOARD OF MEDICAL EXAMINERS

Accepted as read by Secretary of Board. Drs. Leon J. Menville and J. Kelly Stone approved for recommendation in re vacancy on Board in August, 1950.

### MATTERS REFERRED FROM EXECUTIVE COMMITTEE

*Amendment to By-Laws in re increase Journal subscription for members:* Approved.

*Membership in Research Council for Economic Security:* Discussed and request for membership tabled.

### ACTION TAKEN

Following resolution, approved in 1947, repealed: "That the Louisiana State Medical Society go on record as opposed to any reduction in isolation regulations for lepers in Louisiana, which requires 12 successive negative cultures for Hansen's Bacillus (*B. Laprae*) taken at monthly intervals. All treatments and research involving infectious cases

be continued at the Leprosarium in Carville, Louisiana. The splendid treatment, nursing care and recreational features given inmates at the Leprosarium in Carville are to be commended."

*Discussion of Charity Hospital fees throughout the state:* Motion made and carried that First, the State Society go on record as opposing any pay beds in charity hospitals; Second, emergency cases admitted to charity institutions be transferred as soon as the emergency is over; Third, that this matter of finances and arrangements be referred to an appropriate committee for discussion with the officials of the Hospital Board with the first two principles in mind. Motion was also made and carried that the Hospital Board should be advised that the Committee on Medical Indigency of this Society was not at liberty to make the recommendations to Mr. Bankston, as quoted in the report of the Committee, since such recommendations had not previously been presented to the State Society and at this meeting were not approved.

*Badges for annual meetings:* Selection to be left to secretary-treasurer's office.

*Discussion concerning affiliate membership in State Society for negro physicians:* Motion made and carried that the House of Delegates go on record as opposing affiliate membership in the State Society for negro physicians.

*Discussion concerning Section 10 of Chapter X of the By-Laws:* Referred to Committee on Medical Defense with request that report be made at next annual meeting.

*Recommendation of doctors and laymen to serve on LPS Board:* Drs. Rhett McMahon, A. V. Friedrichs, O. B. Owens, W. L. Bendel, George W. Wright, Edwin L. Zander, C. M. Horton, J. W. Faulk, Arthur D. Long, Guy R. Jones, P. H. Jones, N. J. Tessitore, Ashton Thomas, Charles B. Odom, C. J. Brown, M. C. Wiginton, Charles McVea and H. W. Boggs. Laymen—Don Ewing, Pat Turner, T. B. Bennett, Frank Lais, Jr., E. H. Curtis, Bill Clark, N. C. McGowan, Jim Bell, John LaNasa and Scott Wilkinson. It was stated that Dr. Leckert had declined to serve and Dr. Owens expressed appreciation for his service in the past.

*Discussion in re collection of dues for AMA:* Motion that Dr. Fuchs discuss subject with Dr. Lull and then refer matter to Executive Committee—amendment to motion that secretary secure opinion from attorney in regard to State Society collecting dues; also that the Society take no action which will make the organization an agent of the AMA. Motion and amendments voted upon and carried.

*Discussion in re consultation with Louisiana State Medical Society before appointments are made by AMA.* Motion made and carried that the Louisiana State Medical Society request the AMA to consult with the House of Delegates, Executive Committee or delegates of this Society before

nominations or appointments are made of Louisiana physicians to any committees, councils, commissions, boards, etc. in order that there may be better understanding and cooperation between the LSMS and the AMA.

*Discussion of domicile for State Society:* Motion made and carried that a committee be appointed to function with the committee appointed by the Orleans Parish Medical Society to investigate establishment of a domicile for this Society in New Orleans.

#### MATTERS DISCUSSED—NO ACTION TAKEN

*Anticipated chiropractic bill.*

#### AMENDMENTS TO BY-LAWS

*Section 1 of Chapter X* to state "in any courts in the State of Louisiana."

*Section 4 of Chapter IX—Journal subscriptions for members* increased from seventy-five cents to one dollar per year.

#### ELECTION OF OFFICERS, COMMITTEES AND DELEGATE AND ALTERNATE TO AMA

President-elect—Dr. Edwin L. Zander, New Orleans.

First Vice-President—Dr. U. S. Hargrove, Baton Rouge.

Second Vice-President—Dr. J. Kelly Stone, New Orleans.

Third Vice-President—Dr. H. Guy Riché, Baton Rouge.

Chairman, House of Delegates—Dr. A. V. Friedrichs, New Orleans.

Vice-Chairman, House of Delegates—Dr. J. P. Sanders, Shreveport.

Councilor, First District—Dr. Ashton Thomas, New Orleans.

Councilor, Second District—Dr. Joseph S. Kopfler, Kenner.

Councilor, Fourth District—Dr. Paul D. Abramson, Shreveport.

Committee on Journal—Drs. C. C. Cole and E. L. Leckert; both of New Orleans—3 years. Dr. Leon J. Menville, New Orleans—2 years.

Committee on Medical Defense—Dr. W. A. Elender, Houma—3 years.

Committee on Public Policy and Legislation—Dr. C. Grenes Cole, New Orleans, Chairman; Drs. Charles B. Odom and E. L. Leckert, New Orleans; Dr. Charles R. Gowen, Shreveport—all for 1 year.

Committee on Scientific Work—Dr. W. H. Giltentine, New Orleans and Dr. J. E. Knighton, Jr., Shreveport—both for 1 year.

Delegate to AMA (1951 and 1952)—Dr. Val H. Fuchs, New Orleans.

Alternate to Delegate to AMA (1951 and 1952)—Dr. George Hauser, New Orleans.

PLACE OF 1951 ANNUAL MEETING  
New Orleans.



LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Third Thursday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

COMMUNICATIONS

The following communications, received from the Office of the District Attorney of the Parish of Orleans and from Mr. Charles A. Farwell, are printed in accordance with instructions of the House of Delegates at the 1950 Annual Meeting held in Baton Rouge. It is requested that members of the Society give these subjects serious consideration.

April 21, 1950

Dr. Roy B. Harrison,  
Hibernia Building,  
New Orleans, Louisiana.  
Dear Doctor Harrison:

The office of the District Attorney and I personally wish to thank you and your profession for the excellent cooperation and understanding in our recent investigation of the "abortion problem" in the New Orleans area.

This investigation is far from complete. However up to this time there is considerable evidence indicating that the profession is totally unaware of their legal obligations in abortion matters. It seems that doctors generally are unaware of their legal obligations to report deaths under suspicious circumstances. I therefore take the liberty of recommending a more widespread dissemination of the legal obligations imposed by Article 39 of the Louisiana Code of Criminal Procedure which reads as follows:

"It shall be the duty of any physician and of any person in charge of any hospital or institution, or any other person, who shall have first knowledge of the death of any person who shall have died suddenly, accidentally, violently, or as a result of any suspicious circumstances, or without medical attendance within thirty-six hours prior to the hour of death, or in any case of death due to what is commonly known as an abortion, whether self-in-

duced or otherwise, to immediately notify the coroner and the district attorney of the death. It shall be unlawful for any undertaker, embalmer or other person to remove any body from the place where such death occurred, or to prepare same for burial or shipment, or to destroy and clothing or other evidence connected with said body, without first notifying the coroner and the district attorney and receiving permission to remove the body from both such officers."

Again I thank you and the profession and your organization for the cooperation we have received in the past.

Very truly yours,  
Matthew S. Braniff,  
Assistant District Attorney

April 17, 1950

Dr. Edwin H. Lawson,  
2700 Napoleon Avenue,  
New Orleans, La.

Dear Dr. Lawson:

I am writing you at the suggestion of Dr. Roy Harrison.

I am Chairman of a Committee to raise approximately \$1700.00 to pay for a bronze plaque of Sister Stanislaus which is to be placed in the main lobby at Charity Hospital.

Inasmuch as the State Medical Convention takes place next week, I am writing to ask you to introduce a resolution in the House of Delegates to the effect that all doctors who knew and loved Sister may have the opportunity to contribute to this fund. I think through this method more men attending the convention will be reached than through any other method, and I would greatly appreciate your doing it.

Any contribution should be made payable to the Sister Stanislaus Memorial Fund and sent to L.

A. Millet, Secretary-Treasurer, Charity Hospital of Louisiana at New Orleans.

Sincerely yours,

Chas. A. Farwell

### SURVEY OF PHYSICIANS INCOMES

In the April issue, the importance of the survey of physicians incomes was presented. We recently had the following additional comment from Dr. George F. Lull:

"I hope that you will urge physicians in your society to fill out these schedules which have been prepared by our Bureau of Medical Economic Research and the Department of Commerce. This study bids fair to become the most comprehensive ever made of the incomes of a profession. I hope that you will especially urge your members with small practices to reply in full, as I am informed

that earlier surveys of physicians' incomes have not obtained a representative number of responses from physicians with small practices. A fine response from every physician who receives a questionnaire will help to correct certain misinformation regarding physicians' earnings and expenditures by the American people for the services of physicians."

### NATIONAL FEDERATION OF OBSTETRIC-GYNECOLOGIC SOCIETIES

Dr. Woodard D. Beacham of New Orleans was made President-Elect of the National Federation of Obstetric-Gynecologic Societies at the meeting of this organization, held in connection with the International and Fourth American Congress of Obstetrics and Gynecology, May 15-20, 1950, at the Statler Hotel, New York, N. Y.

## BOOK REVIEWS

*Physiology of Heat Regulation and the Science of Clothing*: Edited by L. H. Newburgh. Pp. 457. W. B. Saunders Co., Philadelphia, 1949. Price \$7.50.

This interesting monograph, edited by Dr. L. H. Newburgh and contributed to by 15 other scientists, is a description of the work which was done during the last war by various groups engaged in testing some of the ideas, and working out some of the problems, which were imposed on the services by the necessity of fighting in all parts of the world. It was prepared at the request of the Division of Medical Sciences of the National Research Council. In World War II fighting took place anytime regardless of intense cold and deep snow, sodden, half-frozen earth, burning desert sunshine, or humid tropical heat. There were many problems to be solved by the members of the committee instructed to work on these particular problems, such as the problem of determining the maximal rate of heat production that can be endured in the hottest and most humid environments. At the other extreme, they needed to know how long survival is possible in cold water and very cold air, and to what extent and for how long man can survive in the cold by increasing his production of internal heat through

muscular activity. The editor also points out that, as we all know, clothes worn by man are dictated by custom and fashion and little thought has been given to the protective possibilities inherent in the raw fibers and in the various ways they can be combined into cloth.

The first part of the book is devoted to the human response to the climatic environment. This includes chapters on adaptations to climate among non-European peoples, thermometry, heat transfer, the regulation of body temperatures, adjustments to heat and cold, and indices of comfort. The first chapter on adaptations to climate among non-European peoples by F. R. Wulsin is an extremely interesting account of the climate and clothing in primitive civilization and in present civilization, in very warm and very cold climates. Wulsin points out that examination of the evidence shows that great civilizations have arisen and have maintained themselves, both in hot dry and in hot wet climates. This should answer, he feels, once and for all, the question whether such a feat is possible. In the case of hot dry climates, the civilizations studied were the creations of white men; in the case of hot wet climates, they were the creation of Malay-Mongoloids, of the varied populations of India, and of American In-



dians. White men came late to hot wet countries; they explored and subdued them with furious energy; whether they would or could have founded great civilizations there, if they had been the first occupants, is a question that cannot be answered. Other interesting chapters in this part of the book are those on the physiologic adjustments to cold and the range of physiologic response to climatic heat and cold. While there is considerable literature on the physiological adjustments to heat and these responses and ranges are quite well known, there has not been as much work done on the adjustments to cold, or on the limit of cold which man can tolerate. Throughout the monograph there is a considerable amount of extremely valuable data which will make this book of great value to those interested in the subject of heat regulation and heat transfer. Much of the data has not appeared in other sources and still other data has been compiled and is included here in convenient form.

The second part of the monograph is a discussion of clothing, the thermal barrier. This includes chapters on physical properties of clothing fabrics, laboratory and field studies in the desert, tropics, protection against dry cold, wet cold, water and the special problem of gloves. There is a concluding chapter on clothing and climate and an appendix with definitions, miscellaneous figures and conversion factors. It might be well to mention that this appendix is an extremely important part of the book, since in the work it was necessary to define new units, particularly in connection with problems of clothing. The monograph will make interesting reading even to the person who is not intimately concerned with the general problem. To those who are concerned with temperature regulation and clothing, this volume will, of course, be invaluable.

H. S. MAYERSON, Ph.D.

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Davis, W. C.: *The Compleat Pediatrician*, Durham, North Carolina, Duke University Press, 1949, sixth edition, 256 pages. Price \$4.75.

Tremendous contributions to pediatric literature in recent years, together with the many advances in modern antibiotic therapy, have justified almost innumerable changes in the text of this sixth edi-

tion of a very useful handbook for all physicians who deal with disease in infants and children.

Reset in the same very practical system, with valuable cross references and excellent indexing but with no conspicuous increase in bulk because of a very terse style utilizing many clear abbreviations, this volume will continue to be useful in complementing standard conventional textbooks and current journals in the field. Highly recommended and endorsed—not as a complete textbook for students, but as an up-to-date digest to be employed for quick reference purposes.

R. V. PLATOU, M.D.

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*Occupational Therapy, Principles and Practice:*

Edited by William Rush Dunton, Jr. and Sidney Licht, M.D. Springfield, Ill., Chas. C. Thomas, 1950. Pp. 321. Price. \$6.00.

Although a number of books on occupational therapy have appeared in the growth and development of this subject since World War I, this volume is unique in that it is written for physicians rather than for the occupational therapist. Dr. Dunton is a psychiatrist and has long been interested in occupational therapy in mental diseases. Dr. Licht is a specialist in physical medicine. The two points of view as represented by the editors have contributed to the usefulness of the book in its choice of subjects for inclusion. Individual chapters are written by such recognized authorities as Andrew L. Banyai, Walter E. Barton, Paul White and Jerome M. Schenk. This book will fill a real need for the physician.

MARY LOUISE MARSHALL

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*Human Growth*, the story of how life begins and goes on. Based on the educational film of the same title, by Lester F. Beck, Ph.D., with the assistance of Margie Robinson, M.A. Harcourt, Brace & Co., 1949. Illus., 124 p. Price \$2.50.

*Human Growth*, by Lester A. Beck, is a small compact volume written for the express purpose of presenting clearly the process of birth and growth to early adolescent youngsters. Its primary use is not as reading material for teen age children but for parents, educators and others, whose duty

it is to direct courses in sex education. Simple understandable description of sexual development and differences are found in the first two chapters and serve as a basis for the explanation of parenthood and birth which are discussed in the remaining chapters. Candid explanations of menstruation, reproduction, and birth are given in a form easily utilized for teaching purposes. Each of the four chapters contains a question and answer section composed of the most common questions which arose when the material was presented to groups of children.

The book is closely modeled after the film *Human Growth*, which has received wide useage in schools, clubs, etc., and is of equally high caliber. It has many clear diagrams properly labeled which help to illustrate the material presented. The content is presented in a scientific manner and no moral or religious implications are made.

MARY GRAHAM, M.D.

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*Helpful Hints to the Diabetic:* By William S. Colens, B.S., M.D. and Louis C. Boas, A.B., M.D. Thomas, 1949. Illus., 135 p. Price \$3.00.

This book is advertised as a "companion book to the professional textbook 'The Modern Treatment of Diabetes Mellitus,'" by the same authors.

It is intended to clarify problems which continually confront the diabetic. It is very nicely illustrated, and all of the stock therapeutic uses and abuses are evaluated. Frauds and Fads are exposed.

I. L. ROBBINS, M.D.

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*Medical Management of Gastrointestinal Disorders:* By Garnett Cheney, M.D. Year Book Pub., 1950. Illus. 478 p. Price \$6.75.

A brief survey suggests that the author treats of his subject via the symptoms and complaints of the patient. Much of the subject matter seems reminiscent of other authors and other books. Yet, it is a new and personal experience has taught the author that much of orthodox medical practice is no longer tenable, and so the unique contribution

is its elimination based on twenty-five years of experience.

I. L. ROBBINS, M.D.

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*Progress in Neurology and Psychiatry;* an annual review. volume 4.: Edited by E. A. Spiegel, M.D. Grune & Stratton, New York, 1949. 592 p. Price \$10.00.

Like previous volumes of this series, the present one contains papers of varying quality. Some, like that of Bender, are restricted in scope and present essentially critical essays on the subject they deal with. Concerning such articles, this reviewer cannot but be enthusiastic since they give to the non-expert reader a good understanding of the status of the particular field. By contrast, other papers such as the general reviews of anatomy and physiology, seem to be little more than haphazard collections of precis of articles in the literature. They are of no value to the man working in the field, who would of course, go to the general reader who can obtain no clear idea either of the direction in which the field in question is going, or of the significance of the material presented. If subsequent volumes were to concentrate on critical evaluations rather than content coverage one could be unreservedly enthusiastic about its value.

D. A. FREEDMAN, M.D.

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#### PUBLICATIONS RECEIVED

Charles C. Thomas, Publisher, Springfield, Ill: Transactions of the American Goiter Association, 1949; Races—a Study of the Problems of Race Formation in Man, by Carleton S. Coon, Ph. D., Stanley M. Garn, Ph. D., and Joseph B. Birdsall, Ph. D.; Water and Salt Depletion, by H. L. Marriott, M. D.

Henry Schuman, Inc., Publishers, New York: Harvey Cushing, Surgeon, Author, Artist, by Elizabeth H. Thomson.

W. B. Saunders Company, Philadelphia: Proctology in General Practice, by J. Peerman Nesselrod, M. D.

Random House, New York: You and Your



Heart, by Dr. H. M. Marvin, Dr. Irving S. Wright, Grune & Stratton, Inc., New York: Breast  
Dr. Irvine H. Page, Dr. T. Duckett Jones and Dr. deformities and their Repair, by Jacques W.  
David D. Rutstein. Maliniac, M. D.











UNIVERSITY OF CALIFORNIA  
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